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COMMITTEE PRINT

1978 FOOD AND AGRICULTURAL OUTLOOK

Papers Presented at the Food and Agriculture Outlook
Conference Sponsored by the U.S. Department
of Agriculture—Held in Washington, D.C.,
November 14-17, 1977

PREPARED FOR THE
COMMITTEE ON AGRICULTURE, NUTRITION,
AND FORESTRY
UNITED STATES SENATE

DECEMBER 19, 1977



Printed for the use of the
Committee on Agriculture, Nutrition, and Forestry

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FOREWORD

The annual Outlook Conference, sponsored by the U.S. Department of Agriculture, convened in mid-November under a new title that is appropriate to its expanded program and the broader audience these forums have recently been attracting. The 1978 Food and Agricultural Outlook Conference was designed to reflect this wider recognition of the agricultural outlook's critical implications for all Americans, both as consumers and as concerned citizens.

The new attention to such subjects as family diets, natural resources, and environmental impacts was matched by efforts to enhance the value of the Conference to those who produce, process, and market our food and fiber products. Special briefings on weather and world agriculture were presented so as to put into perspective the latest analyses of recent developments, emerging trends, and supply and demand prospects for the coming year.

Of course, the recently signed Food and Agriculture Act of 1977 generated particular concern at this year's Conference because of its implications for producers and consumers. The new concepts of farm program acreage and the acreage allocation factors, combined with prospects for heavy use of USDA price support programs and higher direct payments to farmers under the Act, gave this year's program an unusually high profile.

The usual uncertainties facing producers also demanded special consideration. Even with another year of strong exports and expanding domestic markets, large U.S. supplies of agricultural products will be more than offsetting. While for consumers, this indicates a relatively favorable retail food price picture in coming months, it does not provide a basis for any farmer optimism. Farm prices are expected to continue relatively weak, and farm income may be down from 1977.

In the interest of providing the members of the Senate Committee on Agriculture, Nutrition, and Forestry, the Senate, and the general public with timely information regarding the agricultural setting and outlook in 1978, I have asked that the papers presented at this year's Food and Agricultural Outlook Conference be published as a committee print. While the views and analyses presented in these papers are those of the authors and not necessarily of the Committee or of USDA, the Committee nonetheless wishes to recognize these Conference speakers as professionals and experts in their respective fields.

HERMAN E. TALMADGE, *Chairman.*

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CONFERENCE OPENING

(By John C. White, Deputy Secretary of Agriculture, U.S. Department of Agriculture)

Fifty-six men, women, and children ate lunch an hour ago because of the hard work and pride of one American farmer. This event occurs three times a day, every day of the year.

Today, less than 4 percent of our population feeds all 215 million Americans and countless millions around the world. This is a startling achievement! It's unsurpassed anywhere in the world.

But, it is a fact that many Americans take for granted. They seem to think that America's food flows from an eternal spring—that it is unending.

Those of you here in Washington this week to participate in Outlook 1978 share our concern and don't take America's farmers, or the food they produce, for granted.

On behalf of Secretary of Agriculture Bob Bergland, I am pleased to be able to welcome you to this annual conference. I am confident that you will be presented with information that will show how vital American agriculture is to our domestic economy and to the peoples of the world. I am also confident that you will share our belief that America's food and fiber system continues to be the United States' number one industry!

Times have changed in Washington. For the first time in U.S. history an administration has set realistic objectives to guarantee the future of America's producers and the food and agriculture industry. We have put forward a comprehensive national food policy. This policy and other new initiatives are based on hard realities:

We will maintain a healthy rural America with a strong family-farm oriented system of agriculture by moving aggressively to strengthen export markets for U.S. farmers.

We are moving as rapidly as possible to develop new energy resources and promote energy conservation throughout the food and agriculture industry.

We are committed to a major human nutrition research and education effort that will provide all people with needed information to eat more nutritious foods and upgrade their diets.

We are making our domestic and foreign food assistance programs responsive to the people they are designed to help.

As President Carter said at Notre Dame earlier this year, "We know that the world cannot long exist one-third rich and two-thirds hungry."

I'm certain that there will be several speakers during this conference who will talk in detail about the current situation facing farmers, so I'm not going to belabor the present serious problems or how we got into these problems.

Those of you here today—particularly farmers—know what has happened in the last 5 years to net farm income, to commodity prices, to the costs of inputs.

When you look at charts of these, it reminds me of a train going over the Continental Divide. But this administration got on the train as it headed through the valleys on the western slope.

Since 1973, farm income has fallen precipitously. But we think we've bottomed out. It's still a very serious situation, but that doesn't mean we give up. We have to turn poor farm income around and we will.

Harry Truman had a saying that if you can't stand the heat, you should get out of the kitchen. Well, I don't see farmers giving up. I can assure you that Bob Bergland isn't giving up either.

In fact, we're encouraged that the outlook for commodity prices and net farm income is changing.

It's changing because of several events. Look at the world grain situation—the wet harvest conditions in Canada, the decreased production in the Soviet Union, Poland, and much of the Southern Hemisphere.

We think there will be increased export demand for U.S. wheat, corn, and other feed grains.

Look at cash commodity prices. Since June 13, wheat at Kansas City has increased 58 cents per bushel. That's more than just a seasonal adjustment. Since October 21, corn at Chicago has gone up 36 cents per bushel. Normally, the seasonal low for corn is in November, but it appears to have been on that date. Soybeans at Chicago have increased substantially—88 cents a bushel since October 21.

And, we are hopeful that there will be even greater increases.

If we look at agricultural exports for the last fiscal year, they increased over \$1 billion from fiscal 1976. The value of exports was \$24 billion. This was a healthy increase in volume, given the fact that prices have been depressed.

There is a new realism in Washington and a much stronger commitment to farmers and all participants in the food and agriculture industry.

The President, Secretary Bergland, and I believe that all policies and programs that are adopted during this administration must meet four crucial tests to be successful.

They must:

- be good for America's producers and help them make a better income or our policies will fail;
- be good for consumers and meet their needs for abundant food at fair prices or our policies will fail;
- meet our international commitments because food is the foundation for peace in the world; and
- meet the humanitarian goals of the United States for our citizens and people throughout the world.

We believe our policies meet these tests, and we're putting these principles to work in the Food and Agriculture Act of 1977.

The new law:

- provides price support loans for our major commodities that will keep the United States competitive in world markets;
- provides the mechanism to support farmers' income through deficiency payments, that this year alone will total almost \$1.2 billion to wheat producers;

- establishes a 30-35 million metric ton food and feed grain reserve, primarily farmer owned and controlled. It will help farmers by effectively insulating substantial stocks from the marketplace, reducing downward price pressure. It will also provide protection to domestic and foreign consumers from bad harvests. It will allow the United States to be a dependable supplier of quality food and feed grains, even when our production declines because of weather. This reserve will help us avoid needless export controls and embargoes that lead to the loss of foreign markets and crucial sales for American producers;
- provides set-aside authority to bring production more closely in line with potential demand, so that farmers will produce for markets. We have announced a 20-percent set-aside on wheat; tomorrow we will announce our decision on feed grains;
- makes substantial revisions in the foreign food assistance programs. It strengthens our commitment to use Public Law 480 as a major market development tool, not a surplus commodity disposal giveaway;
- broadens the research missions of the Department of Agriculture. It grants new authority to search for and develop alternate energy resources for agriculture;
- mandates research priorities on human nutrition to make certain that we know as much as possible about the nutritional needs of all people; and
- reforms the food stamp program through the elimination of the purchase requirement and the tightening of eligibility standards. It makes food stamps more available to our citizens who need them the most.

In addition to the tools provided in the new law, the administration is moving with greater determination to:

- expand market development programs abroad;
- liberalize and make more effective use of CCC credit in foreign sales;
- complete the multilateral trade negotiations in Geneva and advance the interests of farmers; and
- negotiate international commodity agreements and world food reserves.

Since February 22, 1977, this administration has taken 16 separate administrative actions to assist American farmers. These include increasing commodity loan levels, lowering interest rates charged for commodity and farm facility storage loans, expanding the maximum amount available for farm loans, making commodity loans available on all farm-stored grains, and providing emergency drought and disaster assistance.

To conclude my comments, I want to refer to the latest action by President Carter—the creation of the Cabinet-level Working Group on Food and Agriculture Policy that is headed by USDA.

In his announcement, the President summed up this administration's position on food and agriculture policies. He said:

This administration is determined to develop food and agriculture policies which help the people who need help the most, both in the United States and abroad. Our policy should

give producers the greatest possible access to foreign markets, while helping poor nations improve their own ability to produce and distribute food.

It would be very easy for me to stand before you this afternoon and say that we have all of the answers to farmers' problems. The fact is that we don't.

But, we are strongly convinced that our approach to food and agriculture, our approach to solving low farm income, our approach to providing all consumers with bountiful food supplies, and our approach to meeting our international humanitarian commitments is the most workable.

The critical problems plaguing farmers and ranchers today are being solved. It will take time for these new policies and programs to take hold and work.

I'm convinced that America's farmers are going to have a better income and a brighter future because of our policies based on reality, not rhetoric.

**U.S. FARM AND FOOD POLICY
IN THE WORLD OF THE SEVENTIES**

U.S. FARM AND FOOD POLICY

(By Howard W. Hjort, Director of Economics, Policy Analysis and Budget, USDA)

I am going to be quite brief on the topic, "Food and Agricultural Policy in the World of the Seventies," and devote most of the time to discussing the rationale for the policies we now have.

Anyone involved in farm policy has only to think back over the last few years to come to the realization that weather is the major source of year-to-year variability in world production. We tend to think of that variability in terms of grains and our attention often becomes riveted there. But it's also true for sugar, cotton, oilseeds and all the other crops. Extreme year-to-year swings in production on a world basis must be taken into account in policy formulation. It's a factor that we have no control over, which seems to say in policy terms that we should have programs which can accommodate that kind of variability, even though over the longer run, technology is the major determinant for increasing production.

The Food and Agriculture Act of 1977 addresses both of these production determinants. The objective that we have been guided by in the development of the legislative program and in the initiatives taken by the administration was a rather simple one: to protect producers and consumers at home and abroad from natural and economic disaster.

It carries with it a series of related policies and programs. First it reserves. If we don't have a reserve, we simply cannot be a reliable supplier in the world. The weather factor is just too important. The favorable weather in 1976 led to a significant excess of grain which provided us with the opportunity to remove some of that excess from the market and into a reserve under rules and regulations for accumulating and releasing it. In late August we committed ourselves to a 30 to 35 million metric ton grain reserve, with nearly half wheat and about half coarse grains. A small amount of rice is also included. That reserve will be in hand prior to the beginning of the 1978-79 marketing year. The commitment to a 17 to 19 million ton feed grain reserve was reaffirmed again late yesterday afternoon in connection with the feed grain set-aside announcement.

The reserve, as I said, helps to insure that we will be a reliable world supplier. It is a hedge against export controls and will help prevent extreme fluctuations in prices. And in a long run context, neither extremely high prices nor extremely low prices are advantageous to producers or consumers.

The reserve concept was adopted and approved by Congress in the 1977 act. It is the first time to my knowledge that the Government of the United States has had an explicit reserve policy. We are now part

of an international force working toward the adoption of that policy on an international scale. This is one of the major changes in the programs and policies of today compared to those of yesterday.

For the basic farm programs and policies in the Food and Agriculture Act of 1977 are not very different from those of the recent past. They are basically an extension of programs operated since at least the mid-1960's. They continue the concept of setting the relationship of grain price supports in a manner so as to permit market forces to dictate if wheat should be used as a feed grain. We had been in that competitive position from 1964-65 through the fall of 1976. There was a brief aberration of that policy in the fall of 1976 which had to be corrected in this bill and in the policies of this administration. It wasn't a major consequence for that brief period when things were out of line. They are back in line again.

Market price supports are higher in this bill but they are set at levels designed to permit us to continue to be competitive in world markets. We have to export to have a healthy agriculture. We have to export to have a healthy economy. The level is simply a judgment question. It's our judgment that a level of approximately \$2 per bushel for corn, our major grain, is a level that permits us to maintain our competitiveness in international markets. That basic philosophy is the same with respect to cotton, other grains, and other commodities included in the bill.

The law allows us some flexibility if we are wrong, and the U.S. is not competitive at the \$2 loan for corn. The market will tell us by pricing close to that loan level. And if that occurs, the Secretary may reduce the particular market support level in any one year by 10 percent and never below \$1.75 per bushel. I am hard pressed to find an area in the world or, I'll put it another way, I am hard pressed to believe that the weighted average world cost of production would be less than \$1.75.

The target price concept included in the 1973 act was continued in the 1977 act but the basis for tying it to the cost of production was made more explicit. Congress had previously directed the Department of Agriculture to assess cost of production and that set of studies was used in the development of target price levels. The same components of production costs are used in establishing the target prices for all of the major commodities that were in the bill—cotton, wheat, corn, sorghum, barley and so on. The administration proposed that same concept be used for soybeans, but that was not included in the final bill. This, I think, is the first time that the equity principle, if you will, has been employed on such a broad basis.

There is another point on cost of production and target prices on which I find great confusion. Target prices are based upon cost of production but target prices do not cover cost of production. In arriving at target prices, as I said, the same components of cost will be applied to those commodities. But that is not the same thing as saying that they provide protection and a guarantee for covering all costs. They do not. That part of the philosophy of farm programs and policies is a continuation of what we've had over the years. The farm programs have not been designed to provide a guaranteed income to the producer, they've been designed to provide protection against economic disaster.

There is room for market prices to operate in this program and I don't believe that target prices are going to create any major problems in terms of acreage shifts and so on.

A couple of other changes were made with respect to allotments. In the past, what a grower could do depended upon what he had done in some historical period. That system provided a rigidity that frequently was not to the individual's best interest. So the idea of using the current year as the basis for the program instead of previous years was proposed and was accepted. This provides producers with more flexibility than any other legislation. So it doesn't really make any difference if producers in 1977 shifted to soybeans and cut back on corn because of market indications. They're not penalized for doing so in the 1978 program if market forces and programs are such that he should increase his corn production relative to soybeans. He's free to do so.

There is, in addition, a way a person can guarantee total protection if he so chooses. With respect to USDA's series of other initiatives on an international scale, some of them are in the bill and some of them have been taken by administrative action.

With respect to the bill itself, in terms of cost, the major item was the food stamp program, and in terms of pages, the major item was the research section. I'm not going to cover those at this time because our panel is going into them in detail.

TOWARD A U.S. FOOD POLICY

(By Carol Tucker Foreman, Assistant Secretary, Food and Consumer Services,
U.S. Department of Agriculture)

Through most of history, the human struggle for food has been directed primarily at simply getting enough to eat. This has led to Government food policies that have focused mainly on increased production, better means of food preservation, and improved systems for the transportation and distribution of food.

Now, we are at a point where we have achieved a high degree of success in satisfying our domestic needs for adequate production, preservation, and distribution. Yet out of our very successes, new and troubling issues arise.

Today, production in this country is so large and reliable that we are able to feed ourselves and a large portion of the rest of the world and use food sales to help balance trade deficits. Yet this has also meant that we have recurring surpluses and that producers have trouble surviving.

Moreover, although millions of Americans are unable to get enough to eat without assistance, for millions of others nutritional problems are a result of consuming too much food.

We have been so successful in using chemicals to increase production, retard spoilage and preserve foods that we must now be concerned with the health effects of chemicals themselves.

We have become so dependent upon food processing and upon nationwide food distribution systems that the farm value of production bears little relationship to final costs of food.

And finally, because domestic population growth is leveling off and urbanization has slowed down, the rate of increase in domestic demand for food—which has been growing dramatically for years—may be slowing down.

We need to begin giving the most serious consideration to forging a new food policy—a policy that responds to the dilemmas facing us today in a changed world. What should such a new policy look like? Secretary of Agriculture Bob Bergland addressed this issue recently.

The Secretary stated:

We think this country must develop a policy around human nutrition, around which we build a food policy for this country and as much of the world as is interested. And in that framework we have to fashion a more rational farm policy.

We've been going at it from the wrong end in the past.

The goal of this new policy sought by the Secretary would be to make available an adequate supply of safe, nutritious food at stable, reasonable prices—while providing a fair return on investment to

farmers, processors, and retailers, and decent wages to workers in the industry. The new policy would also be designed to provide for assistance to those at home and abroad who cannot afford the cost of a nutritious diet.

I would like to share with you this afternoon my views about what a new food policy, built around the framework established by Secretary Bergland's statement, should look like.

To design such a new food policy I believe we will have to consider at least six elements.

First, we must determine what are people's nutritional needs, and what levels and types of production are necessary to meet those needs.

Second, the policy must determine the scope of the role the Nation will choose to play in meeting international needs for food, as well as the means to be used. What portions will be done through trade, or through assistance? How much additional domestic production will be necessary to enable us to meet those needs?

Third, the policy must consider what measures are necessary to stimulate and sustain that level of production.

Fourth, the policy must take into account the need to assure that food is available at a reasonable cost.

Fifth, the policy must include means to assure that the food supply is safe and of high quality.

Sixth, the policy must devise programs to assist those who cannot afford adequate food at market prices.

I would like to discuss each of these elements with you in more detail. But first, I think it's necessary to observe that this new policy would involve change—including change in some of our existing programs and policies. It is important that if such changes are made, the resulting burdens should be spread across the population to the greatest extent possible. It is unreasonable to assume that farmers or processors or any other segment of the population should have to carry all the burden of change. At a minimum, change will probably require provision of adjustment assistance to those who will have to modify their traditional way of doing business. Further, consumer prices may increase as the costs of changes in processing and retailing are passed on. But, in the long run, the costs of a new system should be more than compensated for by increased efficiency and competition, reduced costs for advertising and some processing, more stable prices, a halt to the precipitous decline of modest-sized farms and perhaps most important, reduced health care costs as nutrition improves at home and abroad.

Now, to the six elements of the new policy.

I. THE DETERMINATION OF NUTRITIONAL NEEDS

First, a food policy should be based on a detailed assessment of what the nutritional needs of the people are. To even begin to develop a food policy, we must first know what persons in various age, sex, racial and ethnic groups, lifestyles and geographic locations need nutritionally for optimal growth and performance and continued well being. Determining these needs will require a commitment to increased human nutrition research. A small program of nutrition research has been car-

ried out in the United States since the 1870's but we still do not have adequate answers to some of the most basic questions.

For example, the recommended daily allowances of various nutrients are widely used, but are often of limited value in helping a person select a proper diet suited to particular stages of life and level of physical or mental activity. For some nutrients—such as some trace minerals—so little reliable data exists that no RDA at all has been established although the nutrients may be essential to good health.

We also need research on the relation of diet to disease. It now appears that 6 out of the 10 leading causes of death in the United States may be degenerative diseases whose onset may to some degree be related to nutritional factors. Some recent studies have linked various nutritional factors to cancer.

At the same time, we need to learn more about the nutritional consequences of our increasing reliance on convenience foods, processed foods, and eating away from home.

To forge an effective food policy, we will need not only to increase our knowledge of nutritional requirements—but also to determine what levels and types of production are necessary to meet these needs. This will require an ability to translate nutritional needs into production terms. We should know, for example, how much wheat and what kinds of wheat should be produced to insure people with adequate levels of B vitamins. It is also important that we know what nutrients are available at consumption after processing. Naturally occurring vitamins change when wheat is milled. We will need to know if the vitamins can be replaced by fortification. These and similar assessments will have to deal with the combinations required to provide the necessary nutrients in diets as consumed, not just as generated in the laboratory.

II. THE U.S. ROLE IN FEEDING THE WORLD

The second element of a national food policy is the role the United States chooses to play in meeting international food and nutrition needs. The Federal Government must determine what portion of this will be done through trade; what portion through assistance, and how much additional production is necessary to meet those needs.

The 1977 Farm Act calls for a domestic grain reserve system. It also encourages the Secretary of Agriculture to "enter negotiations with other nations to develop an international system of food reserves" for humanitarian relief. Participation in an international emergency food reserve is crucial if the United States is to live up to its international obligations. It can also demonstrate that participation in such a system will not ruin domestic farm prices or destroy foreign food markets.

But the complexity of international food issues demands more than a reserve system. Through Public Law 480, amended slightly by the 1977 act, the Federal Government has for 23 years used U.S. farm production as both a means of developing foreign markets for U.S. goods and as a means of providing food aid. A national food policy must determine how to balance the needs of hungry people abroad with the needs of American producers eager to find new markets. We cannot allow overemphasis on one to undercut the importance of the

other. Nor can we permit political consideration to determine where we provide decent assistance.

Maintaining good, stable trade relationships is extremely important. It is clear that a vigorous trade program is essential to keeping stability in our balance of payments. In addition, stable relationships protect American farmers—and consumers—from the fluctuations of a speculative market in food exports. We must strive to avoid the circumstances that have led in the past to pressures for embargoes on food exports. The embargoes of soybeans in 1974 and wheat in 1975 benefited no one. Trading partners and farmers were hurt. No discernible benefits accrued to consumers. Embargoes are basically an admission of policy failure; and in an economy like ours, in which food is the keystone, we cannot afford such failures.

One final point: Although America's capacity for food production is unparalleled in the world, we cannot permit the need to sell American food abroad to destroy the incentive for other less developed nations to become more self-reliant in food production. The United States cannot base its entire food economy on exports.

III. STIMULATION OF ADEQUATE PRODUCTION

The third element of a basic food policy is to stimulate and sustain production adequate to meet domestic and international nutrition needs, and our country's trade needs.

In one sense, this does not represent a major departure from the policies we have followed for a number of years. Government policies have long encouraged certain kinds of production and marketing, and discouraged others through support prices, research, and regulation. Government production policies have never benefited all producers equally. Livestock growers, for example, are not covered by support programs. Fruit and vegetable producers are only sporadically covered by Federal and State marketing orders. Federal Government actions have always helped some areas of agriculture at the expense of others. Support programs leading to higher feed grain prices, for example, hurt livestock producers.

What a new food policy must do is to reassess which areas of agriculture are supported and promoted. In the future, the basis of such decisions must be to meet nutrition and trade needs. This will necessarily involve a reorientation of production patterns.

Naturally, a new food policy that reorients production patterns and support systems will initially be regarded as threatening by some persons. But the new policy does not have to be a threat. Changes can be carefully designed to avoid inequities, to make sure that one region of the country or some group of producers are not victimized by new policy goals, and to remedy inequities.

Indeed, any new policy must be constructed so that over the long run, it will cause less dislocation and be less inequitable than the policies of the past. In previous years, Federal policies and the results of federally funded research have caused economic dislocation of farmers (especially small farmers), of farmworkers, and of some processors and retailers—and usually without any compensation.

There are, of course, a number of factors that would limit re-orientation of production patterns. Among these are geographical factors and farmers' knowledge of new and different crops.

One example of the type of action I am talking about, in shaping production policy to meet nutrition and trade needs, is the creation of a domestic wheat and feed grain reserve. The new reserve system established by the 1977 Food and Agriculture Act is aimed at protecting farmers against low prices in years of surplus, and at providing an emergency food supply to meet domestic nutrition needs. The creation of the grain reserve provides a floor for farm production and is a basic step toward stable prices for one of our most essential crops. It also will provide the opportunity for Government to prove it can administer a production program equitably.

Land price problems

One fundamental issue of production policy that was not addressed by the 1977 act is the problem of skyrocketing land costs. Record grain prices in 1972 kicked off a boom in land prices that has not relented, despite the dropping grain prices farmers now face.

Nationally, agricultural land prices have doubled, on the average, since 1971. In the Midwest, prices have tripled. In the mid-Atlantic area urban development pressures have pushed up land prices. In the Midwest, speculation based on high farm prices has pushed up costs.

It is estimated that a new farmer needs \$500,000 to buy a farm and enter production. Few individuals have access to the credit necessary to borrow \$0.5 million. This encourages purchase of land by banks, foreign investors and corporations, and it encourages renting rather than farmer ownership of land.

Moreover, if land costs continue to inflate as they have, the Nation can expect ever-higher consumer food prices—which would in turn, if past trends remain true, further inflate land costs. In addition, continuously inflating land costs will effectively doom the family farm and seriously deplete competition among food producers. Such a result is clearly out of line with fostering stable prices.

The Federal Government should begin an intensive investigation of the reasons for rising land costs and begin to develop policy recommendations to slow the trend. At the same time the Department of Agriculture must continue to develop more satisfactory formulas for dealing with land costs in support programs.

Finally, a new production policy will have to assure the farmer of adequate supplies of the elements of production. The energy crisis of 1973, and its resulting fuel/fertilizer price spiral, proved how vulnerable our food system, and individual farmers, are to energy shortages. Consideration should be given to the possibility of mandatory allocation of petrochemicals for farm use. A new production policy might also include energy and soil conservation incentives and incentives for new kinds of energy-saving pest control and fertilization techniques.

IV. REASONABLE FOOD COSTS

A fourth element of a new food policy must be to assure the availability of food at reasonable prices.

In past years, full production has sometimes been touted as the answer to reasonable prices. But full production on the farm will not,

by itself, guarantee moderate retail price levels. One of the most important elements in determining food prices is what happens to food after it leaves the farm.

Marketing costs have risen so sharply during the past few years that they now comprise 60 percent of the total food bill. Indeed, the Economic Research Service observes that the food price inflation of the 1970's has, to a large extent, been attributable to marketing cost increases. Between 1974 and 1976, marketing costs increased about 10 percent annually. According to the ERS, "increased marketing costs will again account for most of the rise in consumer food expenditures in 1977."

It is true that some of the marketing cost increase is attributable to higher energy costs and the general inflationary trend. But if we are to have both reasonable levels of farm income and reasonable prices for consumers, we simply must develop mechanisms to discourage unnecessary costs from being built into the food system between the time food leaves the farmer and the time it reaches the consumer.

This means that the Government must cease any encouragement of industry practices, and halt the issuance of any Government regulations, that add to costs unnecessarily. Government transportation regulations are an obvious area where review and revision could lead to reduced costs. The "back haul" regulations are a case in point.

Other areas that may also lead to unnecessary and inflated costs are inadequate competition, excessive advertising, and excessive packaging.

Inadequate competition is a particularly troublesome area. Recent studies have indicated that economic concentration in food manufacturing and retailing is increasing. According to Russell Parker, former assistant director of economics at the Federal Trade Commission, 20 large grocery chains accounted for 37 percent of total grocery store sales in the United States in 1975. This represents an increase of more than one-third from the 27 percent controlled by the 20 largest chains in 1948. In a study for the Congressional Joint Economic Committee (JEC) earlier this year, University of Wisconsin researchers found that the 4 largest grocery retailers in 194 metropolitan areas held an average of 52 percent of grocery sales. In one-fourth of those areas, they held 60 percent or more of sales.

Parker believes this leads to higher prices for many consumers. He asserts that FTC data show that "grocery chains use higher markups or gross margins in high market share areas and have lower markups where they have lower market shares."

The study prepared for the JEC reached similar conclusions. It found "strong evidence that 'monopoly overcharges', that is, prices above those in competitive markets, are likely in markets that are dominated by one or two firms and/or where sales are highly concentrated among the largest four firms."

The study estimated that total consumer overcharge due to economic concentration in 1974 was \$662 million. The researchers concluded that overcharges vary from city to city, depending on the extent of concentration. They found that, in 1974, consumers in one city with four firm competition suffered a \$1.6 million overcharge, while in another city with only two firms controlling most of the market consumers experienced an \$83 million overcharge.

Concentration is also increasing among food processors. The number of food manufacturers has declined substantially over the past 30 years. In 1947, there were 44,000 food manufacturers. In 1972, there were only 22,172. This may seem like a large number when compared to domestic automobile or steel manufacturers but several major food lines are highly concentrated.

Four firms control 84 percent of the breakfast cereal market and 95 percent of canned baby foods. Two firms have 58 percent of the soft drink market. There are no meaningful national figures on concentration in the bread baking industry, but on a regional basis, the 4 top firms in 18 different cities accounted for about 60 percent of consumer bread purchases.

Inadequate competition may explain why soft drink prices, pre-sweetened cereal prices and bread prices rose as sugar and wheat prices went up a few years ago, but have not followed the downward spirals of those raw materials.

Many individual areas of food processing do remain competitive and fairly reflective of changes in the prices of basic commodities, but this is an area where public policy has skirted serious problems. The latest data available on food marketing in many cases is from the 1966 studies of the National Commission on Food Marketing. Ten-year-old studies are of a limited value in making food policy, and a first step in this area should be creation of another commission or a specific mandate from Congress to update the food marketing studies. Once the data is available, Government should act to assure adequate competition in the food industry.

Of course, when competition on the basis of price declines, competition based on "product differentiation," and making heavy use of advertising, often increases. Competition among airlines is a classic case in point. Airlines now spend enormous sums to tell us that their planes fly in "friendly skies" or feature attractive hostesses who will "fly us" to our destination.

This same pattern is frequently seen in parts of the food industry. The decline of price competition is replaced by an upsurge in "product differentiation" competition. In the food area, advertising and packaging are key elements of this growing type of competition. While both advertising and packaging have valid market place roles, expenditures for both have grown beyond reason in some product lines. Both together have become a significant portion of the increasing food marketing bill and need reexamination by manufacturers and policy-makers.

Advertising now accounts for about 3 percent of the food marketing bill. Some of it is price specific but most of it is directed at product differentiation.

Our major concern is the increasingly heavy role of advertising in promoting non-nutritive food items. Government is becoming more concerned with the health implications of food advertising. The FTC has moved to regulate nutritional claims and may act to strictly limit food advertising aimed at children. The FDA Commissioner has made clear his view that advertising is an extension of labeling and should be regulated accordingly.

There may be other ways Government should encourage food value as measured by price and nutrition. Companies that advertise food on television might be required to give equal time to nutrition messages. Government could make comparative nutritional price information available to consumers in places where people buy food and/or in the electronic or print media.

Government encouragement of advertising through tax deductibility has been attacked by some consumer organizations and this area is one for examination in public policy formation. Any limits on tax deductibility would, however, have to deal with the problem of special provision for advertising by new competitors entering concentrated markets, and for competitors with a small share of concentrated market.

Packaging is another important area. Packaging costs now account for 13 percent of the food marketing bill. Between 1958 and 1974, the consumer product cost represented by packaging doubled for items like dairy products, produce, beverages, and candy. The Economic Research Service says that packaging costs are likely to increase 7 percent a year through 1980. The increase will come both from growing costs of materials and from increased use. We don't know how much of these costs are accounted for by unnecessary packaging, nor do we know how much packaging is used solely for product identification purposes or how much packaging is needed for protection in shipping and sales. It is unlikely that Government can make reasonable decisions about packaging without that knowledge.

It should also be noted that packaging now accounts for 30-40 percent of total municipal solid waste—and expenditures for solid waste disposal amount to about \$4 billion a year. Reasonable public policy should assess whether that is an acceptable cost.

A few final points on food prices and what to do about them should be noted. There are two courses of action that we must resist as possible cost-cutting measures. One is to cut food costs by cutting farmer income even further. The other is to permit the use of questionable substances in foods or to relax health and safety regulations. There are few if any acceptable tradeoffs of safety for savings. A cheap food supply purchased at the expense of health protection is no bargain.

V. SAFE AND HIGH QUALITY FOOD

Given what I've just been saying, it should come as no surprise that the assurance of a safe and high quality food supply is the fifth element of my food policy. Although food safety is virtually unchallenged as an appropriate goal, the means to achieve food safety have been in dispute for over 80 years. The Federal effort to assure food safety dates back to 1906, when the original Pure Food and Drug Act was passed—in large part because of a grave public concern over the use of chemicals in prepared foods. The acceptability of chemicals in food continues to be a hotly debated issue today.

There are a number of laws on the books—such as the Food and Drug Act, the Meat Inspection Act, and the Poultry Products Inspection Act—that are firm in their rejection of unsafe chemicals. A

food policy that has as its first concern the nutritional well-being of the public can ill afford to be less strict than present law. Such a food policy must also include vigilant enforcement of these laws.

This may not be enough, however. Government action to promote food safety may need to enter new areas. Present laws deal with food additives and manufacturing processes. Yet evidence now suggests links between high consumption levels of substances such as salt and fat, and such diseases as high blood pressure and a variety of cancers. A food policy concerned with food safety should be able to deal with these problems as well. Perhaps we should become as concerned about the fat in a hot dog as we are about the nitrite.

In any event, whenever Government takes action on a food safety issue to protect the health of its citizens—whether the action involved an unsafe chemical or a substance such as fat—there is a potential for adverse economic impact on some companies and individuals. For example, pending Government decisions that could lead to bans on the use of tetracycline in animal feed or the use of sodium nitrite in meat processing may have significant impacts on meat producers and processors.

When Government acts to exclude previously approved products, public policy on food safety should include ways to ease the transition. This would require, at a minimum, collection of adequate data on what the real costs to the industry will be. Present data are almost always the industry's "worst case" assessment of the impact. Policy may also have to include mechanisms for easing the financial burden of smaller firms.

I know some will argue that consumer sovereignty in the market place should permit consumers to purchase anything, no matter what its health effects. But in other areas, the Federal Government does not fall back on that argument as a way out of its responsibilities. The Federal Government regulates dangerous or toxic chemicals. We attempt to control water and air pollution. Government funds the construction of municipal sanitation systems. Federal programs help protect people from disease via vaccination and inoculation campaigns. Government should play no less responsible role in the food system.

Government policy must also deal with the emerging issue of food quality. Public policy should address more adequately such questions as the construction and composition of processed foods. Industry is engaged in a constant effort to bring new technology to food processing. The results are sometimes ice cream that is not like what mother used to make, or tissue from ground bone in hot dogs. It is unlikely that public policy should exclude the results of new technology from the marketplace but it must find better ways to assure consumers that the quality of new foods—their nutritional value, taste, and appearance—are as good or better than the previous product. We must also find better ways to differentiate between products associated with certain basic materials or processing methods and those made in laboratories or with new ingredients or methods so that customers will understand what they are purchasing.

VI. DOMESTIC FOOD ASSISTANCE

Finally, food policy must also deal with those people who do not have the ability to afford an adequate diet. Present Government policy supports food for such individuals through a variety of programs that approach the problem in various ways. The food stamp program increases food consumption by increasing income and limiting the increase to food purchases. The school breakfast, school lunch, and other child nutrition programs provide meals in an institutional setting. The women, infants, children food program (WIC) provides prescription food packages to vulnerable persons at nutritional risk during the most critical phase of human growth and development.

The President has proposed to eliminate the food stamp program in favor of a general cash assistance program. His proposal assumes there will be no appreciable loss of nutrition as a result. Available studies seem to support that assumption. They show that low-income families tend to allocate their money wisely and to get more nutrients per food dollar than the middle income.

In the institutional feeding programs—such as school lunch—the issue of food quality is becoming a growing concern. In the past few years, some items of questionable nutritional value—such as fortified grain-fruit products and formulated milk products, were allowed into some of these programs. We have moved to prevent their further use.

Plate waste and meals that fail to meet portion and nutrition requirements are additional problems of the institutional feeding programs.

These programs must be upgraded by placing greater emphasis on serving healthy, appetizing diets in attractive settings. These programs should be learning laboratories for good nutrition—teaching by example that food can be both nutritious and appetizing.

The women, infant, children feeding program has perhaps the greatest capacity to use good nutrition to improve health and assist in breaking the cycle of poor childhood development that is often associated with poor nutrition. It provides high quality protein, iron, calcium and vitamins A and C to pregnant women, nursing mothers and young children. Because WIC operates through health care programs, it integrates health care, nutrition education and food assistance. It has been shown to result in substantially increased visits to prenatal and neonatal health clinics—as well as in the increased consumption of nutritious foods during a critical growth stage.

CONCLUSION

The food policy I've described—and the questions it raises—may make some people uncomfortable. Consumers worry that changes in the food economy will hurt them by creating higher prices. Farmers are already angry because more of the return from retail food sales doesn't flow to them. They fear that Government intervention in production in the name of health or nutrition will put them in an even more precarious economic situation. Processors and retailers already complain that their profit margins are too low, and that more Government regulation will cause their financial ruin.

The concern about prices and profits is reasonable. But we cannot ignore our basic responsibilities to safeguard the nutrition and health of our citizens. The challenge before us, therefore, is to shape a new food policy that provides healthful food, and does this at reasonable prices with a reasonable return to those who get the food to our tables. This is a big job, but it is one of the most important tasks of public and private policy in our time.

U.S. DIETARY GOALS

(By D. Mark Hegsted, Professor of Nutrition, Harvard School of Public Health¹)

The Dietary Goals for the United States published by the Senate Select Committee on Nutrition and Human Needs essentially state that Americans eat too much—they eat too much meat, too much fat, especially saturated fat, too much cholesterol, too much sugar and too much salt. They should eat more fruits, vegetables, grain products, especially whole grain products, and unsaturated fat. It is clear that a statement of this kind is not very useful, even if you agree with the generalities, unless some quantitative estimates are provided. You cannot translate the statement into a dietary pattern without at least suggesting what is meant by too much and what might be a reasonable intake. The report suggests a reduction of fat from the current level estimated to be between 40 and 45 percent of calories to about 30 percent and that one-third of this should be saturated and one-third polyunsaturated fatty acids; that the diet should not contain more than 15 percent of calories as sugar. These changes would result in an increase of total carbohydrate consumption to 55–60 percent of calories of which 40–45 percent would be starchy materials. It is recommended that protein should provide 12 percent of calories; that cholesterol intake should be of the order of 300 mg/day and salt about 3 g/day.

It is important to emphasize that such a diet does not represent an ideal diet. We do not know what an ideal diet is. The Dietary Goals are an attempt to arrive at a more reasonable dietary pattern than the diet of most Americans. I cannot review much of the evidence upon which the Dietary Goals are based, but the major health problems of the United States and other affluent countries are coronary artery disease, stroke, cancer, diabetes, hypertension and obesity. These are the diseases which kill Americans and extract a tremendous toll in medical costs, disability, and premature death. Treatment of these diseases is ineffective. There must be increasing efforts toward their prevention or amelioration. All of these diseases are clearly associated with the diet we eat and many other countries with less rich diets do not have this disease pattern. In addition to the epidemiologic evidence there is extensive animal experimentation which supports the proposition that diet is an important causal factor in all of these diseases.

The best experimental evidence is available for coronary heart disease. This disease alone kills something of the order of 600,000 Americans, many of them before age 65 or whatever a suitable retirement age may be. There is sufficient evidence demonstrating a causal rela-

¹ The views expressed in this paper are those of the author and not necessarily those of the USDA.

tionship between diet and this disease alone to recommend that Americans change their diet. There are abundant data showing that:

Inappropriate diet→elevated serum lipids→atherosclerosis
→heart attack

It is certain that the dietary factors primarily responsible for this sequence of events are the amount and composition of dietary fat and the cholesterol content of the diet. It is important to emphasize that in American men the serum lipid levels rise during the late teens and twenties, many have extensive atherosclerosis in the twenties yet coronary heart disease begins to become significant in the thirties and forties and progressively more men have heart attacks as they become older. Thus, it is certain that the early atherosclerotic lesion which develops in young men does not induce heart attacks directly. It is also certain that the severe atherosclerotic lesions which occur later are nearly irreversible. It is important to emphasize this since it means that dietary modification in middle-aged atherosclerotic men cannot be expected to have much effect on this process. As many of you are aware, a number of current dietary trials are now underway. These may be worthwhile but they cannot demonstrate the ultimate effect of diet upon coronary heart disease. A truly definitive experiment is beyond our capabilities. It would involve the recruitment of a cohort of teenage boys, feeding them a diet which would prevent the development of hypercholesterolemia and determining the disease pattern over the next 20 or 30 years or longer. This is essentially an impossible experiment. Many people have optimistic and unwarranted expectations about what the current studies may or may not show.

I would also emphasize that if we considered the data available and were truly interested in minimizing the occurrence of heart disease, it is certain that the dietary recommendation would be much more severe than that suggested by the Dietary Goals. Populations that have very little atherosclerosis, and almost no heart attacks, consume extremely low fat and otherwise restricted diets by our standards. Quite frankly, most of us will probably opt for the heart attack, cancer, diabetes or hypertension—which are going to get almost all of us—rather than consume such a diet for a lifetime. Once we are sick—as has been emphasized by a recent television report—we may then be willing to submit to such a diet. It is interesting, incidentally, that the television report indicated, as I have already, that the severe diet did not appreciably modify the underlying atherosclerotic lesion—the electrocardiogram of the patients did not change. A considerable number of smaller dietary trials have already been reported. These have generally shown a modest reduction in heart attacks. More severe dietary restriction may produce more favorable results. We must assume, however, that these improvements are explained, not by modification of the atherosclerosis process but by other mechanisms, possibly by changes in blood pressure and by a reduction in the thrombotic process which is the terminal event in many heart attacks. Whatever improvement can be obtained, it would seem quite certain that the earlier the dietary change is achieved, the greater the effect will be.

It is important also to emphasize that our overall objective is probably not to eliminate heart attacks. It is not likely that immortality will be achieved by good dietary practice. Our objective is to have people die young as late as possible. It would be a tremendous accomplishment if we could delay heart attacks, cancer, stroke, diabetes and hypertension so that they were not prominent causes of death or disability before age 65. Of course, many of us are old enough so that delay to 65 does not seem much of an accomplishment.

What we must search for is some dietary pattern that is "reasonable." Recommendations for dietary changes that are too severe will be ignored by most of us. Some people will establish Goals that are more than we can reasonably expect to achieve—to be President of the company, to make a million, to live to be a hundred, etc. This kind of goal does not mean that we consider that we have accomplished nothing unless we achieve it. Excessive expectation, however, can be discouraging and I believe we are searching for something that we can expect Americans to do.

It is important to emphasize that the nutrition strategy which has been developed in the United States and elsewhere over the past 50 years has been aimed almost totally at the prevention of nutritional deficiency. With the discovery of the vitamins about 75 years ago and the recognition that pellagra, scurvy, xerophthalmia, beriberi and rickets were important causes of death and disability, the primary goal of nutrition became and has been since that time to assure an adequate intake of all essential nutrients. This was tempered slightly by the recognition that obesity was undesirable but the essential message that we have promoted has been and is "Eat more meat, more milk, more eggs, more fruits and vegetables, more cereal products—more of everything—but don't get fat." This message was developed when we had no idea about the ultimate effects of such a diet and essentially no knowledge of the relationship between diet and the chronic diseases which now beset affluent societies.

Nutritionists have often pointed out, correctly, that the great advances which flowed from Pasteur's discoveries demonstrating that disease was caused by infective organisms greatly retarded the acceptance of the fact that disease could also be caused by a deficiency or lack of something in the diet. The theory of infectious disease caused practically everyone to search for a positive causal agent and the associations between poverty, poor hygiene, and deficiency disease made it extremely difficult to eliminate infection as a possible cause of pellagra, for example.

To a considerable degree, nutrition is now faced with a similar problem. We have devoted nearly all of our efforts to assuring an adequate diet—defined as one which contains enough protein, vitamins and minerals. The proposition that much of our ill health is due to overnutrition—not only simply eating too much but eating too much of specific materials—is not easy to accept. It will require a substantial revision of nutritional thought and the nutritional education messages. I should point out that nutritionists cannot claim very much of the credit or blame for our current situation. What we eat is largely the result of our affluence, the agricultural system and the sum of the effects of the food industry. The message, however, has been the same wherever you heard it.

No one is suggesting, of course, that it is no longer important to maintain an adequate intake of essential nutrients. Clearly, it is. We do have some undernourished people in the country but, fortunately, the number is small. They must continue to receive appropriate attention. The only relatively prevalent deficiency disease that we can identify is iron deficiency. This is not limited to poverty groups. Severe iron deficiency, however, is not common and generally requires medical attention. Nearly all nutritionists will agree that we should minimize iron deficiency and we could certainly do it. The problem has been, and continues to be, that we have not been able to convince the medical establishment that it was a sufficient problem to require preventive efforts. It is certainly not in the same league as heart disease and the other killer diseases. It is also certain that we do not have to overeat to avoid iron deficiency.

Most of us have seen a recent report which indicates that deaths from heart disease have declined in the past 10 years or so. This is great. The cause is not clear but it is what we should expect. The American Heart Association has for several years been advising a diet similar to that of the Dietary Goals. The American public has certainly heard of cholesterol—both dietary and serum cholesterol. Consumption of eggs and butter is down; consumption of unsaturated margarine is up. Many more people are jogging and exercising in various ways. Treatment of hypertension and diabetes which often cause heart disease is better. A considerable portion of the public has gotten the message about obesity and has done something about it. The severe hyperlipidemias are now clearly recognized as a health hazard and dietary treatment is prescribed. Both medical and surgical treatment have improved. We should expect an improvement in the situation. But we must also be aware that this improvement leaves a long way to go. There are at least 200,000 premature deaths from heart disease and as we improve the situation our definition of premature will be later and later. We must continue to do what we have been doing but with more vigor at every level.

It has been argued that a dietary pattern such as that suggested by the Dietary Goals is not appropriate for children, pregnant women and others of the population. There is no nutritional basis for this. The protein intakes of Americans are so high that they greatly exceed all reasonable estimates of requirement. The diet suggested would not necessarily reduce the intakes of vitamins and minerals. Indeed, it may very well increase the intake of most. It should also be emphasized that in a technological society of the kind we have the provision of vitamins and minerals is technologically easy. Fortification of foods can be expanded or restricted as we see fit. You simply cannot justify a diet which produces chronic disease in order to obtain sufficient vitamins and minerals.

Nobody expects the American diet to change overnight. Nutrition education, fortunately or unfortunately, whichever way you view it, does not appear to be very effective. But it is clear that the public is demanding better and more explicit information all of the time. As I have already indicated, whatever you may think, the Dietary Goals proposed by the McGovern Committee are relatively moderate recommendations. What the Dietary Goals mean in terms of food is some-

thing like this: Less meat and leaner meat and some substitution with poultry and fish. The protein consumption of the American public is now excessively high. It has no nutritional justification and my guess, for what it is worth, is that evidence will continue to accumulate to show that the high protein consumption is undesirable in itself and not only because meat is a primary source of saturated fat. It means less eggs and butterfat. The dairy industry should begin to look at the restrictions it has imposed upon itself that inhibit the production and marketing of low-fat products and modified dairy products. It means less sugar of all kinds. Products are going to have to be labeled with sugar content and saturated fat content. Sugar, whether deserved or not, has caught the public's eye and there is essentially no nutritional defense of products high in sugar. Products will almost certainly have to be labeled with cholesterol and salt content and, again, there is no positive argument for high consumption levels. It means increased consumption of polyunsaturated vegetable oils in all forms. It means increased consumption of all kinds of fruits and vegetables. This should mean an expansion of the areas producing these nearer to the consumers. It means increased consumption of breads, cereals, and potatoes. These have been the whipping boys since obesity became a popular subject but unjustifiably so. The calories in bread, pasta, and potatoes are not more likely to produce obesity than other sources of calories. Indeed, a leaner diet with less fat and sugar is likely to be helpful in controlling excessive intake of energy.

Some people have argued, of course, that we do not know enough to recommend a change in the American diet. I believe that we know so much that we cannot afford to ignore what we do know. We are dealing with the most important medical problems of our time. Many countries now have a better health record than we do. Sweden which has one of the best has already adopted national nutrition goals similar to the ones we are discussing. The issue is not have we proven that a change in diet will be beneficial or can we predict the results of a moderation in the diet. As I have indicated we do not have the technical capability to answer some of the questions we can easily ask. We can, however, ask what are the proven benefits of the American diet. There are no positive arguments for a diet which is high in fat, sugar, and cholesterol and there are a host of arguments against it. The real issue is how soon, by what mechanisms, and how rapidly we move to encourage consumption of a more moderate diet.

ESTABLISHING AND IMPLEMENTING DIETARY GOALS

(By Gilbert A. Leveille, Chairman, Department of Food Science and Human Nutrition, Michigan State University)

The need for dietary goals is obvious. It is clear that the consuming public has a definite need for guidance in making appropriate food selections that will ensure, insofar as possible, the consumption of a diet providing the essential nutrients and ensuring maximal health. The selection of such a diet is not a simple matter and must be based on current scientific information. The public cannot be expected to be conversant with the scientific information and therefore this information must be translated into food terms which the consuming public can understand and use. The need for such goals should be inherent in any national food and nutrition policy. Such a policy, developed by the National Nutrition Consortium, has been incorporated in previous reports from the Senate Select Committee on Nutrition and Human Needs. Dietary goals are an important component of any national policy for once established and accepted by the public, they have significant impacts upon food production and processing systems. Any effective national policy must also involve an effective education component which will assist consumers in understanding and adopting the enunciated goals.

Recently the Senate Select Committee on Nutrition and Human Needs has published a set of dietary goals. This effort is laudable, but unfortunately the goals leave a great deal to be desired. In many respects these goals are not based on the contemporary science and if implemented would not be in the public interest. I will attempt to point out that these goals are not based on the whole of the scientific evidence available, that they fail to recognize significant problems which exist in our society, and unfortunately, fail to recognize the possible negative impacts which their implementation might have.

Ideally dietary goals should take into account those positive aspects of our current national diets and should assist in sustaining them. Further, they should correct the poor eating habits which can be identified. The American diet has been referred to as "pathogenetic" by some and as "disastrous" by others, implying that our diet has "deteriorated" in the past 50 to 75 years. I submit that such a conclusion is erroneous and misleading. The American diet today is better than ever before and is one of the best, if not the best, in the world today. There is much supporting evidence for this statement. One need merely consider the stature of the current generation of Americans which is coming closer and closer to the achievement of maximum genetic potential. We have virtually eliminated morbidity and mortality from acute nutritional deficiencies. A prime example is pellagra

resulting from macin deficiency, which claimed thousands of lives only a few short decades ago but which is virtually unheard of today. The same could be said for rickets which was overcome by the fortification of milk with vitamin D and of goiter which was eradicated by the iodization of salt. We have seen a remarkable increase in the life expectancy of the American population. We have seen many improvements in the quality of our food supply as measured by its safety, wholesomeness and variety, it is unparalleled in the world today. Taking all of these factors into account, it seems abundantly clear to me that we can put to rest serious concerns about the quality of our diet and any consideration of returning to the diet of days gone by. Any notion that a return to the diet of the past would improve the well-being of Americans is nostalgic nonsense. Rather, we should identify existing nutritional problems and attempt to develop solutions to them. This, it seems to me, is the appropriate challenge of today and the challenge of developing appropriate goals for the American population.

The goals developed by the Senate Select Committee imply that we have been a Nation without dietary goals. This is not completely true. Admittedly we have not had a national food and nutrition policy to give visibility to dietary goals but assuredly we have had guidelines which have served effectively to direct many food and nutrition programs in this country. The guidelines of which I speak are the Recommended Dietary Allowances (RDA) initially established by the Food and Nutrition Board of the National Research Council in 1941 and periodically revised since then. The RDA's were initially developed as a basis for planning food supplies for the military. They have proven to be equally valuable in planning food supplies for the civilian sector of our population and have served admirably as a basis for a variety of feeding programs within the U.S. Department of Agriculture. The RDA's have also been the basis for the establishment of guidelines for nutrition labeling by the Food and Drug Administration. Admittedly the RDA's are considerably different in evolution and purpose from the Senate Select Committee's dietary goals for the United States.

The RDA's differ from the Senate Select Committee's goals in that the former are based on the requirements for known nutrients. The RDA's represent an attempt to establish an allowance that will meet the needs of virtually the entire population. The goals developed by the Senate Select Committee on the other hand really reflect an attempt to provide guidelines for the prevention and/or cure of diseases considered to be public health hazards. Any dietary guideline must have, as a fundamental basis, the objective of meeting essential nutrient needs and, secondarily, must deal with other recommendations that would contribute to ensuring the public health. If such guidelines are to deal with the prevention of specific diseases, there should be a sound scientific basis for their establishment and they should not put any segment of the population at nutritional risk. Unfortunately, the Senate Select Committee's dietary goals have not provided this assurance and they are not based on the whole of available scientific evidence.

The dietary goals, published by the Senate Select Committee, assume 1) that the diseases of primary concern, namely cardiovascular

disease and cancer, are of epidemic proportions in the United States, and 2) that appropriate dietary modifications can delay or prevent these disease. I would like to spend a brief time reviewing these two fundamental assumptions. There is little question that the proportion of the U.S. population dying from cardiovascular disease and cancer has increased dramatically over the past 50 years. I submit that this is not surprising and is to be expected. Accompanying the increase in mortality from cardiovascular disease and cancer has been a significant reduction in mortality from infectious diseases. Advances in medical science have greatly reduced mortality from such causes as tuberculosis, pneumonia, etc. The old adage that "death and taxes are assured" remains to be disproven. Consequently, one would expect that the elimination of death from infectious diseases would simply involve some other cause of death becoming primary. Accompanying the improvements in medical care, sanitation and nutrition has been an increase in life expectancy and an increase in that segment of our population above the age of 65. This proportion of our population has increased significantly over the last several decades and continues to grow. The diseases of primary concern to the Senate Select Committee, namely cardiovascular disease and cancer, are chronic diseases. The probability of incurring these diseases grows with advancing age. Thus, with an older population an increase in both of these diseases is predictable. This is obvious when one examines mortality statistics on an age adjusted basis. While the total number of deaths from cardiovascular disease and cancer have increased over the last several decades, the mortality rate expressed on an age adjusted basis has not increased significantly and, in fact, for cardiovascular disease has shown a significant reduction. Thus, the urgency for changes in diet and life style to control the rate of increase of these chronic diseases is not supported by available evidence. This certainly does not imply that we should not direct our attention to further reducing morbidity and mortality of chronic diseases, for clearly that should be the direction of our research and educational efforts.

I would now like to turn to the scientific basis for the establishment of the Senate Select Committee's dietary goals. It is implied that the high incidence of cardiovascular disease in this country stems directly from an increased consumption of fat, particularly saturated fat, and cholesterol. It is clear that elevated blood cholesterol levels represent a risk factor in the development of cardiovascular disease and that diet can influence circulating cholesterol levels in some individuals. It should also be recognized that diet is not the only factor affecting circulating cholesterol levels nor is the blood cholesterol level the only, nor the major, risk factor in cardiovascular disease. The concept that dietary modification will prevent or delay atherosclerotic heart disease remains a hypothetical and not a demonstrated fact. While it may seem "prudent" to modify one's diet on the basis of existing hypotheses, it hardly seems a sufficient basis for the recommendation of major dietary changes for the entire population. There are many other risk factors associated with the development of cardiovascular disease. The relative importance of each varies from individual to individual and requires a comprehensive evaluation of the relative risk factors for

each individual. Considerable controversy exists among specialists as to the relative value of dietary modification. There is no consensus upon which to establish definitive dietary guidelines for the general population. The Senate Select Committee's report also implies that the intake of sugar contributes to the increased risk of cardiovascular disease in the American population. This conclusion is contrary to the views of most experts in the field. Such a hypothesis has been put forth but experimental evidence supporting the hypothesis is completely lacking. Furthermore, the recommendation for an increased intake of polyunsaturated fatty acids may represent a risk which has yet to be fully evaluated. On the basis of the totality of available evidence, it seems highly premature to make any major recommendations for dietary change for the prevention of cardiovascular disease. Rather, it would seem far wiser to recommend the establishment of a system for the evaluation of individuals to establish that segment of the population at risk and to make appropriate dietary and other recommendations for these individuals.

The report of the Senate Select Committee proposes that a relationship exists between diet and the incidence of cancer. Evidence for such a relationship is extremely meager. The available evidence is strictly epidemiological in nature and remains to be verified experimentally. Such evidence is at best suggestive and cannot be accepted as a reasonable basis for recommending dietary changes. The recommendation of the Select Committee that a shift from foods of animal origin to those of plant origin would protect the population from cancer is unfounded and is not supported by available evidence. Consequently, these recommendations, like those dealing with cardiovascular disease, are premature and unsound.

The Senate Select Committee has recommended a significant reduction in the intake of salt as a means of reducing the incidence of hypertension. Again, this recommendation is based on a modicum of tenuous information. The available evidence does demonstrate that excessive salt intake can induce hypertension in a segment of the population. There is debate as to the proportion of the population whose blood pressure would be influenced by salt intake but it is generally agreed that this represents a relatively small proportion of the population. The desirability of reducing the salt intake of the total population must be carefully examined. It may be wiser to establish means of detecting those individuals at risk and to advise this group of desirable dietary changes. It should also be recognized that not all hypertensives will respond to a reduction in salt intake. Further, virtually all professionals examining the dietary goals of the Select Committee are in agreement that the recommended level of salt intake of three grams per day is excessively low and represents a level which is not achievable.

There are health problems which exist in this country and which should receive attention. Dental caries, obesity and iron deficiency anemia have been identified by several surveys as problems warranting attention. There is also preliminary evidence suggesting that certain population segments have marginal intakes of certain trace elements, particularly zinc and perhaps chromium. These problems deserve attention.

The problem of dental caries has been researched to a significant degree, but the need for further research is evident. It is known that sucrose will contribute to dental caries, however the contribution is not so much a quantitative one as a matter of the form in which sugar is consumed. Sugar in the form of sticky candies remains in the oral cavity, in contact with the dental enamel, for significant periods of time and provides an ideal environment for the proliferation of acid producing microorganisms responsible for the initiation of caries.

The problem of obesity is recognized, however the solution to this problem is not as evident. Certainly reduction of body weight to a desirable level involves a reduction in caloric intake. However, the achievement of that reduced intake remains difficult and is an area requiring further research. National dietary goals should certainly recognize the existence of obesity as a problem and provide incentive to reduce caloric intake. In this regard a reduction in dietary fat could be supported, since this is the most calorically dense component of our diets.

The intake of foods with low nutrient content is partially addressed in the Senate Select Committee's report. Unfortunately the report deals only with the intake of sugar and fails to recognize the fact that other foods, such as alcohol and oils and shortenings can also provide significant calories without providing other nutrients. The Select Committee's report erroneously implies that our intake of sugars and sweeteners has increased dramatically in recent decades. In fact, our intake of sugar on an absolute basis has not increased significantly since 1925. What has changed is the form in which sugar is purchased and utilized. A half century ago most of the sugar was purchased as such and utilized in the home. Today a smaller proportion of sugar is purchased for home use and the greater proportion is consumed in preprepared products, such as baked goods. However, it should be recognized that the proportion of calories derived from sugar has increased, for while the absolute amount of sugar consumed has remained unchanged, our per capita intake of energy has declined. Thus, our consumption of sugar as a percent of calories has increased. There is no evidence that this increased proportion of calories from sugar has any detrimental effect but it should be recognized that sugar is one of those foods having a low nutrient content and from this standpoint a reduction in its consumption might be warranted.

One of the significant concerns regarding the American diet is the fact that due to our sedentary life styles, the consumption of calories is declining steadily. If we are to deal successfully with the problem of obesity, a still greater reduction will be required. The requirement for other nutrients remains essentially unchanged even though caloric intake decreases. Consequently, in order to meet nutrient needs, it becomes important to increase the nutrient density of those foods which are consumed. This requires an even more careful selection of foods to comprise a complete diet, a task which is virtually impossible for some nutrients at very low caloric intakes. For example, it is not unusual for women in the U.S. to be consuming as few as 1,500 to 1,700 calories per day. On this caloric intake it is virtually impossible to meet the 18 mg RDA for iron in the premenopausal woman. In such individuals the iron requirement can only be met by increased fortification of certain

foods or by the use of iron supplements. This appears to be true for other nutrients such as zinc and copper. Consequently, any recommendation for a change in diet must carefully assess the impact that such changes would have on the intake of essential nutrients. To my knowledge this has not been assessed for the changes which the Select Committee has recommended.

It seems that the recommendations for dietary change made by the Select Committee have not been evaluated from the standpoint of other potential, undesirable impacts which they might have if implemented. For example, it is recognized that a significant proportion of the total iron consumption by the U.S. population is derived from meats and meat products. Further, it is recognized that a large proportion of the iron derived from meat is in the form of heme which has a much higher availability than does nonheme iron. If the recommendations of the Select Committee were followed, the likely effect would be a significant reduction in total iron intake and a decreased availability of that iron which was consumed. If this were to occur, the effect on the problem of anemia, which already appears to be widespread, would be disastrous. Thus, the recommended changes cannot be made without recognizing the need for increased iron fortification or somehow increasing the availability of iron from sources other than meat. Similarly the American population derives a significant proportion of its dietary zinc from meat. A reduction in meat intake would result in a significant reduction in zinc consumption. Further, the increased intake of cereal grains would increase the dietary content of phytic acid which is known to bind zinc and reduce its availability. Thus, there is a high probability that implementation of the Select Committee's goals would result in serious zinc deficiency in some segments of the population.

Careful evaluation of the Select Committee's recommendations, demonstrates that they are not based on the available scientific information. Further, there are many inconsistencies and outright errors in the development of the goals. The errors of omission and interpretation are sufficiently great as to cause serious concern if they were taken seriously and applied to any current feeding programs.

There is a need for sound dietary goals to guide feeding programs and to guide individual consumers in their food choices. There is no question, in my opinion, but that the Senate Select Committee's goals are inappropriate and that a totally new effort is required. Such an effort should involve a broad cross-section of expertise from the nutrition, food and medical communities. It should involve consumers and consumer advocates who are knowledgeable about the application of nutrition and food information by consumers. Only in this way can a realistic set of dietary goals be established which will serve the best interests of the U.S. population. I firmly believe that the Department of Agriculture should be at the forefront of such a development. This would seem particularly appropriate since the application of sound guidelines to the feeding programs administered by the Department would impact upon countless thousands of individuals.

THE DIETARY GOALS AND FOOD ON THE TABLE

(By Betty B. Peterkin,* Home Economist, Agricultural Research Service, USDA)

This fall, Secretary Bergland has repeatedly emphasized the importance of nutrition in setting the direction for food and agriculture policy. As part of the Department's responsibility in this area, the Agricultural Research Service—the agency of the Federal Government with primary responsibility for the development of food selection and dietary guidance for the general public—has begun to re-examine its national dietary guidelines.

As one step in that process we have analyzed the goals set forth in the report of the Senate Select Committee on Nutrition and Human Needs—"Dietary Goals for the United States."¹ We hope this analysis, made primarily for the use of USDA, will be useful to others, such as the Select Committee on Nutrition and Human Needs (Committee), nutrition scientists and educators, the food industry, and consumers, in appraising the goals from various perspectives.

The analysis consists of interpretation of the Dietary Goals in terms of the kinds and amounts of foods that will meet them. It explores diets for individuals as well as the population as a whole. Such interpretation makes possible appraisal of the goals for their sociological and economic, as well as their physiological, implications. Through such interpretation, the meaning of the goals for the consumer, the food producer, the food processor, and food regulatory agencies begins to become apparent.

Today, I will review briefly the changes in dietary levels and in food selection suggested by the committee in its report of the Dietary Goals released February 1977. Then, I will discuss some of the many diets for men, women, and children that meet the Dietary Goals and certain changes in food selection and/or food production and processing that might contribute toward achieving the goals.

Dietary goals and food selection—changes suggested in committee report

A bar chart in the committee report shows the difference in sources of food energy, such as fat, protein, complex carbohydrate and sugar, for the "current diet" and for the Dietary Goals. The current diet is based on the nutritive value of the U.S. per capita food supply—the food that disappears into civilian food consumption, some of which may not be eaten.

*The assistance of Richard L. Kerr and Carole J. Shore in the preparation of material presented is gratefully acknowledged.

¹ Select Committee on Nutrition and Human Needs, U.S. Senate, February 1977. Dietary Goals for the United States. 95th Congress, 1st Session. Committee Print.

The goals call for—

A decrease from 42 percent to 30 percent of energy from total fat;

A decrease from 16 percent to 10 percent of energy from saturated fatty acids;

No change in the level for protein—to provide 12 percent of energy;

An increase in total carbohydrate consumption to account for 55 to 60 percent of energy intake;

A decrease in the consumption of sugar—a major source of carbohydrate. The percents on the chart—24 percent of energy in the current diet and 15 percent of energy as the goal—refer to total sugars, including sugars found naturally in foods such as milk and fresh fruits; and

A two-fold increase in the energy from complex carbohydrates, provided in diets mainly by grain products and some vegetables.

Dietary Goals are also specified for cholesterol—about 300 milligrams per day—and for salt, about 3 grams per day. No goal or energy allowance is specified in the report for alcohol, which provides substantial amounts of energy in many U.S. diets.

The committee report gives this advice on how to change food selection to meet the goals:

Eat more fruits and vegetables and whole grains;

Eat less meat and more poultry and fish;

Cut down on foods high in fat and partly substitute polyunsaturated for saturated fat;

Substitute nonfat milk for whole milk;

Cut down on eggs, butterfat, and other high cholesterol sources;

Cut down on sugar and foods high in sugar; and

Cut down on salt and foods high in salt.

These suggestions point the way toward the proposed goals for the “average” consumer in the population. They also present a challenge to food and agricultural researchers, food regulatory agencies, and to food producers and processors to develop and supply the population with foods that are low in fat, especially saturated fat, and that contain less sugar and salt.

Food consumption and dietary goals

The bar chart in the committee report shows that U.S. diets as defined by the food that disappears into civilian consumption do not meet the goals. U.S. diets can be appraised with respect to the goals using two other types of dietary data: (1) food used by households in terms of food brought into the kitchen—as purchased or obtained from home gardens or as gift or pay, and (2) food intake or food actually eaten by individuals. These two types of data were collected nationwide in USDA's 1965–66 Household Food Consumption Survey and are again being collected in our 1977–78 survey. Food intakes of individuals are also obtained in DHEW's Health and Nutrition Examination Survey.

Diets of men, women, and children, in terms of food as purchased, from the 1965–66 survey do not meet the Dietary Goals (table 1). Fat, protein, cholesterol, and sugar levels are higher and carbohydrate levels are lower on the average than the goals. Levels of polyunsaturated

fatty acids, as indicated by linoleic acid, are lower than the goal; and levels of monounsaturated fatty acids, as indicated by oleic acid, and of saturated fatty acids are higher than the goals. Generally, men's diets deviate most from the goals. Fat and cholesterol levels in their diets are somewhat higher than in diets of women and children. On the other hand, sugar levels are lowest in men's diets—providing only 14 percent of food energy (calories) compared to 16 percent for women and as much as 18 percent for children. Average diets for all of the 14 sex-age categories studied² provide the RDA for protein, vitamin A value, thiamin, riboflavin, niacin, and ascorbic acid; but diets for several categories fail to meet the RDA for calcium and iron.

Daily food intakes of 6,000 people from the 1965-66 survey were reviewed with respect to two of the goals—those for total fat and total carbohydrate. Fewer than 3 percent of the persons reported intakes that met the two goals. Essentially none of the 3 percent reported intakes that also met the 1974 Recommended Dietary Allowances (RDA)³ for all of the five vitamins and two minerals studied.

Modifying diets to meet the dietary goals

We modified diets to meet the Dietary Goals using the committee's suggestions for change in food selection, listed previously, and average food consumption patterns (diets) for 14 sex-age categories from our 1965-66 food consumption survey as the basis for certain assumptions about food selection. Alternate assumptions incorporate some possible modifications to foods through change in production and processing. Obviously, other assumptions could be used for deriving diets beyond the dozen or more we have developed to date.

The food consumption patterns used consist of average quantities of 17 food groups in terms of food as you buy it.⁴ Examples of the food groups are milk, cheese, and ice cream; meat, poultry, and fish; eggs; dry legumes and nuts; four groups of vegetables and fruit; four groups of grain products; fats and oils; and sugar and sweets.

Table 2 shows some of the food groups and the nutrient sources of energy they provide compared to the recommended distribution of energy sources of the Dietary Goals. The groups with large percentages of calories from complex carbohydrate are more desirable than those with large percentages from fat for changing diets to meet the goals. To increase carbohydrate levels in diets, as the goals propose, quantities of vegetables and fruits and cereal and bread in the diet will need to be increased. To reduce fat levels in diets, quantities of fats and oils, milk, meat, and eggs will need to be reduced. Other alternatives are to change the composition of certain food groups to provide higher proportions of complex carbohydrate and lower proportions of fat through product modification and/or food selection.

We assumed in modifying diets to meet the goals that the makeup of foods within most of the 17 food groups in the food consumption patterns is the same as the average for households surveyed. For example, the proportion of the citrus fruit and tomatoes group that was reported

² See table 3 for sex-age categories.

³ National Academy of Sciences, 1974. Recommended dietary allowances. Eighth edition.

⁴ Food as purchased or brought into the kitchen from garden or farm in terms of 17 food groups—the 14 food groups shown in table 3 and coffee, tea, and cocoa; punches, ades, and soft drinks; and seasonings and leavening agents.

as fresh oranges by survey households in 1965-66 is assumed in the diets. However, for three groups—meat, poultry, and fish; milk, cheese, and ice cream; and fats and oils—we set up three alternative sets of assumptions (options) concerning the makeup of the group to demonstrate their differing impacts on diets. Option 1, which attempts to follow suggestions for change in food selection in the committee report, is used primarily in this study for interpreting the goals (tables 3-10). Options 2 and 3, which more closely resemble reported food consumption within the three food groups than Option 1, are described and information about diets incorporating them is given in tables 11 and 12. Alterations to usual consumption in Option 1 are as follows:

For the meat group, drippings and all separable fat from meat are discarded; the quantities of meat, poultry, and fish are adjusted from about three-fourths meat and one-fourth poultry and fish to one-half meat and one-half poultry and fish. These changes reduce the percent of calories from fat in the meat, poultry, and fish group from 62 to 54 percent.

For the milk group, skim milk replaces all milk, cheese, and ice cream. This change reduces the percent of calories from fat in the milk group from 49 to 5 percent.

For the fat group, butter and margarine are replaced by soft margarine, and lard and vegetable shortening are replaced by vegetable oils. These substitutions increase the proportion of polyunsaturated fatty acids and decrease the proportion of saturated fatty acids.

A fourth set of assumptions (Option 4) illustrates some changes in food selection with major implications for food production and processing of foods, as well as for Government regulations, that would contribute toward lower levels of fat and higher levels of complex carbohydrate in diets. Assortments of foods in food groups assumed in this option tend to be optimum with respect to lowering levels of fat and increasing levels of complex carbohydrate. In Option 4, as in Option 1, milk is in nonfat form and fats and oils are those types with high proportions of polyunsaturated fatty acids. The meat group includes items of low fat content—lean from Good Grade beef and flesh of chicken or meat and poultry products of comparable low fat composition. This group as modified has an average of 6 percent dietary fat by weight, considerably lower than the 30 percent currently allowed in certain processed meats, such as frankfurters. With respect to grain products, Option 4 includes only the kinds of grain with the highest carbohydrate content, such as rice, and eliminates grain products that contain fat and sugar. Option 4 changes would reduce the percent of calories from fat in the meat, poultry, and fish group from 62 to 32 percent. They would increase the percent of calories from carbohydrate in the grain products group to 89 percent.

The model for developing the USDA family food plans⁵ was adapted and used to adjust the food consumption patterns of each of the 14 sex-age categories to meet the Dietary Goals. The food plan model selects the optimum diet—the quantities of the 17 food groups that represent as little change from the quantities of the food groups in the food consumption pattern as is necessary to meet nutritional

⁵ For additional information on procedures used in developing food consumption patterns and on the model used to modify patterns, refer to "The Thrifty Food Plan," CFE (Adm.) 326, Consumer and Food Economics Institute, Agricultural Research Service, USDA, Hyattsville, Md. 20782.

specifications. "Change" is measured in terms of squared weighted deviations from the quantities of food groups in the consumption pattern, and total change is minimized. The weights are set to cause deviations to be minimized on the basis of percentage change rather than change in pounds of food groups. The squaring of weighted deviations results in small changes in amounts of several food groups, rather than a large change in one group to meet a specification.

Two sets of nutritional specifications (Goals) based on Dietary Goals were used in diets to be discussed here. The two sets differ only in that one includes specifications for levels of five vitamins—vitamin A value, thiamin, riboflavin, niacin, and ascorbic acid—and two minerals—calcium and iron; and the other does not.

Specific goals used in modifying diets in this study are as follows:

1. Total energy intake for each sex-age category equal to the RDA plus 5 percent. The 5 percent is added to allow for some discard of food and still provide for energy needs.

2. Total fat to provide 30 percent or less of energy.

3. Saturated fat to provide 10 percent or less of energy.

4. Cholesterol in daily amounts of no more than 300 milligrams plus 5 percent.

5. Sugar other than that found naturally in foods such as milk and fresh fruit to provide 10 percent or less of energy. The 10 percent goal for such sugar, rather than the 15 percent goal for total sugars in the committee report, was used with concurrence of the committee.

6. Protein to provide 14 percent or less of energy. The 14 percent level, rather than the 12 percent shown in the committee report, also is used with the concurrence of the committee.⁶ The committee's intent in establishing the goal for protein was to maintain the level of protein in the current diet; therefore, 12 percent of energy from protein—the level in the U.S. food supply in recent years—was selected. In the food patterns from the 1965–66 survey of household food consumption used in this study, 14 percent of energy is provided by protein; therefore, a goal of 14 percent is used.

7. Carbohydrate to provide 56 percent or more of energy.

8. Five vitamins and two minerals in amounts of at least the RDA plus 5 percent. (This specification is included in only one of the two sets of goals.)

9. Salt is not included as a specification because of the limited information on the sodium content of foods and on salt added to food.

Diets that meet the Goals, Option 1

Changes in diets for all sex-age categories are required to meet the Goals but not necessarily the RDA (tables 3 and 4) and to meet the Goals and the RDA (tables 5 and 6). Diets modified to meet only the Goals also meet the RDA for the man 20–54 years of age and many of the other sex-age categories.

To meet the Goals, the man 20–54 years old, in addition to changing selections from the milk, meat, and fat groups according to Option 1, would need to buy and use on the average—

Two-thirds more grain products;

One-fourth more vegetables and fruit;

One-eighth more dry legumes and nuts;

⁶ See table 14 for the change in food consumption patterns required to meet the goals with 12 percent of energy from protein.

One-eighth more milk—all of it in the form of skim milk;
 One-half as many eggs;
 One-half as much refined sugar and sweets, such as sirup, and
 jellies;

One-sixth less fats and oils; and

One-fifth less meat, poultry, and fish. Taking into account the adjustment to increase the ratio of poultry and fish to meat, as suggested by the committee and incorporated into Option 1, this decrease of one-fifth for the group translates into a 45 percent decrease for meat and a 45 percent increase for poultry and fish. However, the suggestion by the committee that meat consumption be reduced and poultry and fish consumption be increased—a change in the ratio of meat to poultry and fish—is not necessary if the meat eaten is trimmed of all fat, fat drippings from meat are not used, and other measures to control fat in the diet are followed. Reduction in the overall consumption of meat, poultry, and fish is essentially the same when under Option 1 the ratio of meat to poultry and fish is changed (table 6) and, under Option 2, it is not changed (table 11).

Meeting the Goals for total carbohydrate, sugar, protein, and total fat appears to require the most change in quantities of food groups used for all sex-age categories. The Goals for saturated fatty acids and for cholesterol, except in the man's diet, are not as difficult to achieve. This is partly because the quantities of meats and eggs are restricted due to their relatively low-carbohydrate and high-fat composition and because only fats and oils that have high proportions of polyunsaturates and skim milk are used.

The cholesterol goal of 300 milligrams per person per day is more limiting for men than for women and children. It translates into 110 milligrams per 1,000 calories of energy allowance for the man, compared with 150 milligrams for the woman and 167 milligrams for the 6-year-old child.

The food sources of the calories from carbohydrate, protein, fat, and sugar in the man's diet and in his diet modified to meet the Goals with Option 1 assumptions are summarized in table 7 and discussed below:

Carbohydrate.—To meet the Goals, the quantity of cereal, pasta, flour, and mixes in the consumption pattern is about doubled; the quantity of bread is increased by two-thirds; and the quantity of other bakery products is increased by over one-third. Such increases in the use of grain products are required to meet the carbohydrate goal. Grain products are required also to provide energy in the modified diet to replace energy provided in the diet by several sources, such as the carbohydrate from larger quantities of sugar, the fat from whole milk and less-well-trimmed meat, and fat and protein from larger quantities of meat and eggs. Increased quantities of vegetables and fruit also help provide the needed carbohydrate. Calories from sugar, other sweets, and soft drinks are limited by the sugar goal.

Protein.—The number of calories from protein in the man's diet is the same as in his diet modified to meet the Goals, each representing 14 percent of his total calorie needs. However, the food sources of protein differ. The increased quantities of grain products, required to provide the carbohydrate goal, also provide protein. Therefore, the amount of protein from animal products must be reduced if protein is limited to provide only 14 percent of calories.

Fat.—The man must reduce his fat consumption by 350 calories per day—from 1,200 calories to 850 calories—to meet the goal of 30 percent of total calories from fat. Changes in the composition of the milk and meat groups under Option 1 and the reduction in quantities of meat and eggs account for a reduction of over 300 calories.

The suggestion that skim milk be used in place of whole milk appears to be unnecessarily restrictive as a means of reducing levels of fat and saturated fatty acids, especially in children's diets. Children's diets with whole milk, cheese, and ice cream replaced by their calcium equivalent in skim milk and other assumptions in Option 1 and then modified to meet the Goals contain as much as one-half more fats and oils than children ordinarily consume (table 6). Some of the fat from milk has been reintroduced into the diet as fats and oils.

Sugar.—Sugar other than that found naturally in foods in the man's diet provides 400 calories and must be reduced by 25 percent to provide 300 calories to meet the goal. To accomplish this, quantities of sugar, sirup, jams, jellies, candies, and soft drinks are decreased to provide 140 fewer calories. The quantity of commercially prepared grain products, increased to help meet the goal for complex carbohydrate, adds over 50 calories from the sugar they contain. Sugar levels in children's diets, somewhat higher than in men's diets, would have to be reduced by as much as 44 percent to meet the goal.

Food as served.—A day's food for the man, as served, illustrates the large quantity of grain products in diets modified to meet the Goals under Option 1 (table 8). His modified diet contains 2½ to 3 bowls of cereal or pasta and 13 slices of bread or equivalent in other bakery products, increased from 1⅓ bowls and 8 slices in his usual diet. The woman's modified diet contains 3½ bowls of cereal or pasta and 8 slices of bread or equivalent. The larger amount of cereal in her diet is needed to help provide recommended amounts of iron.

Sample meals for a day for the man meeting the Goals with Option 1 are as follows:

BREAKFAST

| | |
|---|---------------------------|
| Cereal (2 cups) with sugar ⁷ | Margarine ⁷ |
| Skim milk (1 cup) | Juice (½ cup) |
| Toast (3 slices) | Coffee or tea, if desired |

LUNCH

| | |
|---|--|
| Macaroni salad (1 cup) (contains macaroni, ⅓ egg, 2 tablespoons kidney beans, salad oil) | Vegetable (½ cup) Bread (3 slices) Margarine Milk (½ cup) |
|---|--|

DINNER

| | |
|--|---------------------------------------|
| Lean meat, poultry, or fish (5 ounces) ⁸ | Bread (3 slices) Margarine Cake |
| Potato (½ cup) | Coffee or tea, if desired |
| Other vegetable or salad (½ cup) | |

⁷ About 2 tablespoons of sugar or other sweets such as sirup, jams, and jellies and 3½ tablespoons of fats and oils in a day may be added to foods during preparation or at the table.

⁸ Meat and poultry or fish are served on alternate days.

SNACK

Biscuits (3)

Juice ($\frac{1}{2}$ cup)

For the people who may find large amounts of grain products objectionable, diets were modified to meet the Goals while holding the amounts of grain products at levels in the consumption patterns (table 9). Such diets contain large amounts of vegetables and fruits. For example, the man would buy and use each day over 3 pounds of vegetables and fruits and $2\frac{2}{3}$ ounces of dry legumes and nuts. His usual consumption of dry legumes would be quadrupled; of potatoes, tripled; and of other vegetables and fruit, doubled. His consumption of milk would be increased by 60 percent; and meat, poultry, and fish would be reduced by 50 percent. Obviously, diets could be modified to include some increase for grain products and smaller increases for vegetables and fruits than those above.

The "average" man 20-54 years old can meet the Goals and his RDA while continuing to eat the quantity and selection he ordinarily consumes of any single food group, even the eggs and sugar and sweets groups. However, his resistance to change for a food group will result in changes for certain other food groups that are greater than shown for Option 1 (table 6). For example, he could continue to have quantities of whole milk, cheese, and ice cream he is accustomed to and reduce fat, especially saturated fat, in his diet by other means, such as reducing further the quantities of meat, eggs, and fats and oils in his diet.

Diets that meet the Goals, Option 4

Option 4 assumptions (page 5) are used to illustrate what diets meeting the Goals might be like if consumers use foods that are primarily unprocessed, low in fat and saturated fatty acids and refined and processed sugars, and high in complex carbohydrate (table 13). Generally, the diet contains skim milk; eggs, dry legumes and nuts; lean meat from Good Grade beef and flesh from poultry or other items of comparable low fat composition; vegetables and fruit; rice or varieties of other grains or flour of comparable high carbohydrate composition; soft margarine and vegetable oils; sugar and sweets. Elimination of most of the fat from milk and meats, and the sugar and fat from grain products frees fat and sugar and the calories associated with them for use elsewhere in the diet. Much of the carbohydrate goal is provided efficiently by the $5\frac{1}{4}$ cups of cooked rice or equivalent grain or flour, leaving most of the protein goal to be provided by milk and meat. The man can have more identifiable fats and oils and sugar and sweets; however, his diet as a whole, will be less rich in fat and less sweet than the diet he ordinarily consumes.

Food cost

Costs were estimated for the average food consumption patterns and for diets modified to meet the Goals and the RDA using Option 1 and Option 4 assumptions. To estimate these costs, prices paid for food by 1965-66 survey households were updated using the percentage

change from the time of the survey to August 1977 in the average retail prices of about 100 foods priced monthly in U.S. cities by the Bureau of Labor Statistics. Costs apply only to diets as described in this study and cannot be used to indicate cost relationships for other diets modified to meet the Goals. These cost estimates, of course, do not allow for major shifts in price levels of foods which would almost certainly occur if demands for certain foods were markedly increased to meet the Goals.

The estimated weekly costs in August 1977 for a four-person family with average food consumption patterns and with diets modified to meet the Goals and the RDA, with Option 1 and Option 4 assumptions⁹ are as follows:

| | Food consumption pattern | Diet to meet goals | |
|--------------------------|--------------------------------|--------------------|----------|
| | | Option 1 | Option 4 |
| Child, 6 to 8 yr..... | \$10.47 | \$10.96 | \$11.71 |
| Child, 9 to 11 yr..... | 13.02 | 13.72 | 14.71 |
| Male, 20 to 54 yr..... | 15.46 | 14.88 | 16.65 |
| Female, 20 to 54 yr..... | 12.21 | 11.57 | 12.40 |
| Total..... | 51.16 | 51.13 | 55.47 |

Limitations of interpretation

The consumer could select many combinations of foods to meet the Goals. The few combinations presented here are designed for the least deviation from average food consumption patterns for men, women, and children of different ages required to meet the Goals, taking into account suggestions for food selection made in the committee report and alternative suggestions. Minimum disruption of average consumption patterns to meet nutritional goals is consistent with ARS's approach in developing guidance for food selection for the general public. This approach recognizes that food habits are difficult to change and assumes that food guides that disrupt them the least are most likely to be followed. Other combinations of foods, arbitrarily selected to meet the Goals, might be more acceptable to some groups of people.

Consumption patterns used in developing the diets are based on data for food used at home in 1965-66, the most recent data on national household food consumption available. Current consumption, which will be understood better from our 1977-78 Nationwide Food Consumption Survey now underway, probably differs from that in 1965-66. Annual USDA estimates of the national per capita food supply (disappearance data) can be used to indicate differences in consumption that may have occurred since 1965.

Changes in the food supply between 1965 and 1975 and changes to 1965-66 consumption patterns required to meet the Goals are shown in table 10. For this comparison quantities of food groups in consumption patterns and in diets modified to meet the Goals for the 14 sex-age categories were weighted using 1975 population estimates; then change for the average person in the population was determined. For

⁹ The August cost for the four-person family with diets modified to meet the Goals and the RDA with Option 3 (table 12) is \$48.53.

sugar and grains an attempt was made to express quantities on a commodity basis. The change for sugar represents the change when all sugar, including that in commercially prepared products, is taken into account; and the change for grain represents the change in the grain equivalent of grain products used. No attempt was made to take the eggs and fats from commercially prepared bakery products into account.

The nutrition messages behind some of the Dietary Goals seem to have been heard and heeded by at least part of the U.S. population. Between 1965 and 1975 changes in food consumption, as indicated by the food supply, of eggs, butter, lard, margarine, vegetable oils, vegetables and fruit, and poultry and fish were in the direction of changes needed to meet the Goals. This implies that consumption has already moved toward meeting the Goals, and the changes for these foods based on 1965-66 food consumption patterns presented in this study with Option 1 may be somewhat exaggerated. On the other hand, for those foods for which the direction of change in the food supply between 1965 and 1975 is different from that required to meet the Goals—meat, vegetable shortening, sugar and sirup, grains, and milk—changes suggested in the study, with Option 1, may be underestimated.

Conclusions

1. Few people in the United States consume diets that are as high in carbohydrate and as low in fat and sugar content as specified in the Dietary Goals proposed by the Select Committee on Nutrition and Human Needs.

2. Alternative assumptions regarding food selections within certain food groups (options) are used in modifying diets to meet the Goals and the RDA for five vitamins and two minerals. Dietary changes generally include the use of more grain products, vegetables, fruits, legumes and nuts, and less sugar, meat, and eggs. The magnitude of the changes varies considerably for some foods depending on the option used. For example, to meet the Goals with Option 1, in which assortments of foods in the food groups below are based on average household food consumption in 1965-66 except as noted for milk, fats and oils, and meat, people on the average change the foods they buy and use to include—

Sixty-nine percent more grain products (grain equivalent basis) ;

Twenty-five percent more vegetables and fruit ;

Twenty-one percent more dry legumes and nuts ;

Ten percent more milk, all in the form of skim milk ;

About the same amount of visible fats and oils; however, soft margarine and oil replace butter, lard, and vegetable shortening which are higher in saturated fatty acids ;

Fifty-nine percent less visible sugar, sirup, jams, jellies, and candies ;

Twenty-five percent less meat, poultry, and fish, with none of the drippings or separable fat from meat being consumed ; and

Twenty-four percent fewer eggs.

On the other hand, to meet the Goals with Option 4, in which, through changes in food selection and/or production and processing, foods chosen are primarily unprocessed, low in fat and saturated fatty acids and refined and processed sugars, and high in complex carbohydrates, people on the average would change the foods they buy and use to include—

Seventy-four percent more grain products (grain equivalent basis), all of which is rice or grain of similar composition;

Forty-three percent more fruits and vegetables;

Thirty-nine percent more dry legumes and nuts;

Thirty-four percent more milk, all in the form of skim milk;

Twenty-two percent more visible fats and oils; however, soft margarine and oil replace butter, lard, and vegetable shortening which are higher in saturated fatty acids;

Ten percent less visible sugar, sirup, jams, jellies, and candies;

Six percent less meat, poultry, and fish, which is one-half Good Grade beef roast with none of the drippings or separable fat consumed and one-half poultry with only the flesh consumed, or meat, poultry, and fish of similar composition; and

Seven percent fewer eggs.

3. If goals are to be established for carbohydrate, protein, fat, sugar, cholesterol, and salt, such goals probably should be set separately for men, women, and children of different ages. Goals that restrict intake to a given amount per person per day of a dietary element, such as cholesterol and salt, result in diets with much more of the element per unit of energy or per kilogram of body weight for children and women than for teenage boys and men, who have greater food energy needs. Some of the Dietary Goals and suggestions for modifying diets to meet them in the committee's report are not appropriate for use by individuals in all sex-age categories. For example, the goal for protein—to provide 12 percent of energy—is so low that the pregnant woman meeting the protein goal and her RDA for energy will not meet her RDA for protein. The suggestion that skim milk be used in place of whole milk may be unnecessarily restrictive as a means of reducing fat levels, especially in children's diets.

4. Goals based on food consumption in terms of food disappearance data are not necessarily appropriate for developing guides for amounts of foods to buy to meet the nutritional needs of family members or for developing guides for food intake of individuals. The intended use of the goals and the adequacy of detail on food consumption and associated food composition data are some of the factors to be considered in determining whether data on household food use, food intake of individuals, or both should be used as the basis for goals and their interpretation in terms of food. The protein goal in the proposed Dietary Goals is an example of the importance of selection of the appropriate food consumption data base. The aim of the committee in setting the protein goal was to retain the level in the current diet; therefore, a goal of 12 percent of energy based on disappearance data, was established. Yet in the "current diet" as defined by USDA's 1965-66 Survey on household food use, protein provides 14 percent of energy; and in the current diet as defined by the intake of individuals

reported in USDA's 1965-66 Survey and in DHEW's more recent Health and Nutrition Examination Survey, protein provides about 16 percent or more of energy.

Where do we go from here?

As the basis for developing food selection guides for use of the general public and in administering the food programs, USDA has made and must continue to make decisions about acceptable levels of fat, carbohydrate, protein, sugar, cholesterol, and other elements in the diet. To help in making these decisions, the Food and Nutrition Board of the National Academy of Sciences has agreed to make recommendations, even though they may be provisional, as to acceptable levels of 14 dietary elements beyond those for which RDA are established. Levels will be recommended for healthy men, women, and children of different ages. Among the 14 dietary elements are those covered by the Dietary Goals. The Board will include as a part of its considerations the important issues raised by the Select Committee on Nutrition and Human Needs and subsequent statements and studies. We hope to use these recommendations and the RDA's as the basis for nutritional specifications for revising the USDA food selection guides, after the information on food consumption of households and individuals from the 1977-78 Nationwide Food Consumption Survey is available.

The Dietary Goals report and discussions that it has evoked reemphasize the need for additional research:

1. To determine the nutritive value of foods in the marketplace.
2. To provide timely information on the food selections and nutritional status of people.
3. To provide a firm basis for dietary goals for healthy men, women, and children of different ages.
4. To explore adjustments in production and processing to provide foods that will be helpful in meeting such goals.
5. To develop strategies and guidance materials for encouraging consumers to change their food behavior as necessary to meet the goals.

TABLE 1.—FOOD ENERGY DISTRIBUTION AND CHOLESTEROL CONTENT OF FOOD CONSUMPTION PATTERNS, 1965-66¹

| Item | Dietary goals | Child, 6 to 8 yr | Child, 9 to 11 yr | Male, 20 to 54 yr | Female, 20 to 54 yr | Person ² |
|--|---------------|------------------|-------------------|-------------------|---------------------|---------------------|
| Percentage of food energy from: | | | | | | |
| Protein..... | 12 | 14 | 14 | 14 | 14 | 14 |
| Carbohydrate..... | 55-60 | 49 | 49 | 44 | 47 | 47 |
| Sugar ³ | 10 | 18 | 18 | 14 | 16 | 16 |
| Fat..... | 30 | 38 | 37 | 42 | 39 | 40 |
| Linoleic fatty acid..... | 4-10 | 6 | 6 | 7 | 6 | 6 |
| Oleic fatty acid..... | 5-10 | 15 | 15 | 17 | 16 | 16 |
| Saturated fatty acids..... | 10 | 14 | 13 | 14 | 14 | 14 |
| Milligrams of cholesterol per day..... | 300 | 312 | 386 | 553 | 374 | 412 |

¹ Food as purchased or brought into the kitchen from garden or farm to provide meals and snacks for individuals by sex and age, estimated from 1965-66 household food consumption survey. Amounts of food for each sex-age category were increased or decreased proportionately to provide the 1974 recommended dietary allowance for energy plus 5 percent—to allow for some discard of food and still provide for energy needs. Drippings and one-half of the separable fat from meat are assumed discarded.

² Food consumption patterns for 14 sex-age categories weighted by the 1975 U.S. population.

³ Sugar other than that found naturally in foods, such as milk and fresh fruit.

⁴ Goal for all polyunsaturated fatty acids.

⁵ Goal for all monounsaturated fatty acids.

TABLE 2.—SOURCES OF FOOD ENERGY FROM SELECTED FOOD GROUPS

[In percent]

| Item | Total | Carbo- hydrate | Protein | Fat |
|---|-------|-------------------|---------|-----|
| Dietary goals..... | 100 | 58 | 12 | 30 |
| Consumption pattern: ¹ | | | | |
| Milk, cheese, ice cream..... | 100 | 30 | 21 | 49 |
| Eggs..... | 100 | 2 | 33 | 65 |
| Dry beans and peas, nuts..... | 100 | 34 | 18 | 48 |
| Meat, poultry, fish ² | 100 | 2 | 36 | 62 |
| Dark-green, deep-yellow vegetables..... | 100 | 81 | 14 | 5 |
| Citrus fruit, tomatoes..... | 100 | 87 | 8 | 5 |
| Potatoes..... | 100 | 72 | 9 | 19 |
| Other vegetables, fruit..... | 100 | 86 | 9 | 5 |
| Cereal, pasta..... | 100 | 84 | 11 | 5 |
| Flour, mixes..... | 100 | 83 | 10 | 7 |
| Bread..... | 100 | 77 | 13 | 10 |
| Other bakery products..... | 100 | 62 | 7 | 31 |
| Fats, oils..... | 100 | 2 | ----- | 98 |
| Sugar, sweets..... | 100 | 94 | 1 | 5 |
| Option 1 assumptions: | | | | |
| Milk, skim..... | 100 | 56 | 39 | 5 |
| Meat, poultry, fish ³ | 100 | 2 | 44 | 54 |
| Option 4 assumptions: | | | | |
| Meat, poultry ⁴ | 100 | 0 | 68 | 32 |
| Cereal ⁵ | 100 | 89 | 8 | 3 |

¹ Average selections within food groups as used by U.S. households in 1965-66.² Drippings and $\frac{1}{2}$ of separable fat from meat are assumed as discarded.³ Drippings and all separable fat from meat are discarded and amounts of meat, poultry, and fish are adjusted to $\frac{1}{2}$ meat and $\frac{1}{2}$ poultry and fish.⁴ $\frac{1}{2}$ good grade boned beef rump roast with drippings and all separable fat discarded and $\frac{1}{2}$ broiler chicken with drippings and skin discarded.⁵ $\frac{1}{2}$ raw brown rice and $\frac{1}{2}$ white enriched parboiled rice.

TABLE 3.—FOOD FOR A WEEK¹ TO MEET THE GOALS BUT NOT NECESSARILY THE RDA,² OPTION 1³

| Family member | In pounds | | | | | | | | | | | | Fats, oils ³ | Sugar, sweet- |
|----------------|---------------------------------------|------------------|---|--|--|------------------------------|----------|-------------------------------|------------------|-----------------|-------|-----------------------------|----------------------------|------------------|
| | Milk, skim ³ (quart) | Eggs (number) | Dry beans and peas, nuts ⁴ | Meat, poultry, fish ³ | Dark- green, deep- yellow vegetables | Citrus fruit, tomatoes | Potatoes | Other vegetables, fruit | Cereal, pasta | Flour, mixes | Bread | Other bakery products | | |
| Child: | | | | | | | | | | | | | | |
| 7 mo to 1 yr | 4.78 | 0 | 0.03 | 0 | 0.50 | 0.69 | 0.21 | 5.04 | 1.30 | 0.06 | 0.09 | 0.14 | 0.37 | 0.24 |
| 1 to 2 yr | 4.18 | 2.24 | .08 | .73 | .25 | 1.28 | .79 | 3.30 | .85 | .29 | .52 | .47 | .51 | .26 |
| 3 to 5 yr | 4.16 | 2.46 | .20 | 1.45 | .29 | 1.50 | 1.06 | 3.55 | 1.08 | .50 | .95 | .73 | .59 | .30 |
| 6 to 8 yr | 5.06 | 2.79 | .29 | 2.05 | .40 | 1.95 | 1.50 | 4.59 | 1.26 | .72 | 1.36 | 1.05 | .75 | .37 |
| 9 to 11 yr | 5.81 | 3.71 | .32 | 2.74 | .45 | 2.55 | 1.76 | 6.00 | 1.50 | .93 | 1.74 | 1.38 | .90 | .43 |
| Male: | | | | | | | | | | | | | | |
| 12 to 14 yr | 5.85 | 3.84 | .40 | 3.02 | .54 | 2.46 | 1.95 | 5.01 | 1.62 | 1.08 | 2.10 | 1.44 | .95 | .46 |
| 15 to 19 yr | 5.67 | 3.35 | .37 | 3.59 | .47 | 2.58 | 2.55 | 5.49 | 1.31 | 1.33 | 2.53 | 1.72 | .97 | .43 |
| 20 to 54 yr | 2.98 | 3.12 | .31 | 4.13 | .56 | 2.67 | 2.43 | 5.74 | 1.20 | 1.24 | 2.33 | 1.61 | .78 | .41 |
| 55 yr and over | 2.57 | 3.75 | .20 | 3.74 | .70 | 2.38 | 2.04 | 5.55 | 1.40 | .96 | 1.88 | 1.27 | .72 | .44 |
| Female: | | | | | | | | | | | | | | |
| 12 to 19 yr | 4.26 | 3.03 | .24 | 2.62 | .46 | 2.41 | 1.58 | 5.49 | 1.07 | .87 | 1.59 | 1.24 | .73 | .30 |
| 20 to 54 yr | 2.35 | 4.27 | .20 | 3.41 | .57 | 2.69 | 1.62 | 4.88 | .91 | .81 | 1.55 | 1.09 | .54 | .29 |
| 55 yr and over | 2.01 | 4.18 | .12 | 2.71 | .55 | 2.63 | 1.37 | 4.99 | 1.04 | .67 | 1.25 | .97 | .54 | .31 |
| Pregnant | 2.79 | 3.83 | .23 | 3.62 | .68 | 3.25 | 1.97 | 5.89 | 1.14 | 1.01 | 1.90 | 1.33 | .72 | .34 |
| Nursing | 3.03 | 3.38 | .26 | 3.98 | .74 | 3.52 | 2.13 | 6.38 | 1.23 | 1.09 | 2.07 | 1.43 | .78 | .37 |

¹ Amounts of food as purchased or brought into the kitchen from garden or farm.² Recommended dietary allowance for energy plus 5 percent distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruits. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.³ Food consumption in terms of food groups defined as option 1. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) drippings and all separable fat from meat are discarded, and the amounts of meats, poultry, and fish are adjusted to 1/2 meat and 1/2 poultry and fish; (2) milk and dairy products are replaced by their calcium equivalent in skim milk; (3) butter and margarine are replaced by soft margarine, and lard and vegetable shortening are replaced by vegetable oils.⁴ Weight in terms of dry beans and peas, shelled nuts, and peanut butter.

TABLE 4.—CHANGE IN FOOD CONSUMPTION PATTERNS¹ FOR 14 SEX-AGE CATEGORIES REQUIRED TO MEET THE GOALS BUT NOT NECESSARILY THE RSA:² OPTION 1

[In percent]

| Food group | Child | | | | | | Male | | | | | | Female | | | | | |
|------------------------------------|--------------|-----|------------|-----|------------|-----|------------|-----|-------------|-----|--------------|-----|--------------|-----|--------------|-----|-----------------|-----|
| | 7 mo to 1 yr | | 1 to 2 yrs | | 3 to 5 yrs | | 6 to 8 yrs | | 9 to 11 yrs | | 12 to 14 yrs | | 15 to 19 yrs | | 20 to 54 yrs | | 55 yrs and over | |
| | | | | | | | | | | | | | | | | | | |
| Milk, cheese, ice cream | -12 | 10 | 12 | 12 | 12 | 12 | 12 | 13 | 14 | 14 | 12 | 12 | 12 | 13 | 10 | 11 | 12 | 12 |
| Eggs | -100 | -26 | -11 | -12 | -11 | -12 | -12 | -11 | -41 | -41 | -57 | -47 | -12 | -6 | -8 | -30 | -43 | -43 |
| Dry beans and peas, nuts | -73 | -23 | -2 | -2 | -2 | -2 | -2 | 2 | 8 | 8 | 12 | 13 | 3 | 13 | 3 | 8 | 11 | 11 |
| Meat, poultry, fish | -100 | -46 | -22 | -22 | -22 | -22 | -22 | -19 | -20 | -20 | -21 | -12 | -21 | -10 | -13 | -20 | -19 | -19 |
| Dark-green, deep-yellow vegetables | 44 | 26 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 23 | 22 | 18 | 22 | 20 | 17 | 21 | 21 | 21 |
| Citrus fruit, tomatoes | 55 | 28 | 23 | 23 | 23 | 23 | 23 | 21 | 22 | 23 | 21 | 17 | 22 | 19 | 17 | 20 | 20 | 20 |
| Potatoes | 77 | 35 | 30 | 30 | 30 | 30 | 30 | 29 | 30 | 32 | 31 | 25 | 31 | 28 | 23 | 30 | 30 | 30 |
| Other vegetables, fruit | 53 | 27 | 22 | 22 | 22 | 22 | 22 | 21 | 22 | 21 | 21 | 17 | 21 | 19 | 16 | 20 | 20 | 20 |
| Cereal, pasta | 141 | 71 | 70 | 76 | 73 | 73 | 73 | 85 | 95 | 105 | 105 | 76 | 88 | 90 | 69 | 97 | 97 | 97 |
| Flour, mixes | 98 | 60 | 57 | 62 | 60 | 60 | 60 | 69 | 78 | 85 | 85 | 62 | 72 | 72 | 57 | 78 | 78 | 78 |
| Bread | 67 | 42 | 44 | 48 | 44 | 47 | 47 | 54 | 61 | 61 | 67 | 50 | 55 | 58 | 44 | 62 | 62 | 62 |
| Other bakery products | 156 | 42 | 32 | 33 | 30 | 30 | 30 | 33 | 35 | 35 | 37 | 25 | 35 | 33 | 25 | 35 | 35 | 35 |
| Fats, oils | 735 | 127 | 58 | 42 | 42 | 42 | 42 | 15 | 1 | 1 | -18 | -8 | 27 | -13 | 25 | 5 | 5 | 5 |
| Sugar, sweets | 29 | -46 | -60 | -61 | -64 | -64 | -61 | -63 | -62 | -62 | -55 | -52 | -69 | -62 | -55 | -63 | -63 | -63 |

¹ Food consumption in terms of food groups defined as option 1. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) drippings and all separable fat from meat are discarded, and the amounts of meats, poultry, and fish are adjusted to $\frac{1}{2}$ meat and $\frac{1}{2}$ poultry and fish; (2) milk and dairy products are replaced by their calcium equivalent in skim milk; (3) butter and margarine are replaced by soft margarine, and lard and vegetable shortening are replaced by vegetable oils.

² Recommended dietary allowance for energy plus 5 percent distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate, and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake, and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.

TABLE 5.—FOOD FOR A WEEK¹ TO MEET THE GOALS AND THE RDA,² OPTION 1³

| Family member | In pounds | | | | | | | | | | | | | |
|---------------------|-------------------------------------|------------------|---|--|--|------------------------------|----------|-------------------------------|------------------|-----------------|-------|-----------------------------|----------------------------|------------------|
| | Milk, skim ³ quart | Eggs (number) | Dry beans and peas, nuts ⁴ | Meat, poultry, fish ⁵ | Dark- green, deep- yellow vegetables | Citrus fruit, tomatoes | Potatoes | Other vegetables, fruit | Cereal, pasta | Flour, mixes | Bread | Other bakery products | Fats, oils ³ | Sugar, sweets |
| Child: | | | | | | | | | | | | | | |
| 7 mo to 1 yr..... | 4.78 | 0 | 0.03 | 0 | 0.50 | 0.69 | 0.21 | 5.04 | 1.30 | 0.06 | 0.09 | 0.14 | 0.37 | 0.24 |
| 1 to 2 yr..... | 2.86 | 3.20 | .14 | .47 | .34 | 1.41 | .79 | 3.86 | 1.94 | .29 | .61 | .28 | .24 | .20 |
| 3 to 5 yr..... | 3.87 | 2.81 | .23 | 1.51 | .31 | 1.51 | 1.03 | 3.61 | 1.23 | .45 | .90 | .63 | .59 | .32 |
| 6 to 8 yr..... | 5.06 | 2.79 | .29 | 2.05 | .40 | 1.95 | 1.50 | 4.59 | 1.26 | .72 | 1.36 | 1.05 | .75 | .37 |
| 9 to 11 yr..... | 5.81 | 3.71 | .32 | 2.74 | .45 | 2.55 | 1.76 | 6.00 | 1.50 | .93 | 1.74 | 1.38 | .90 | .43 |
| Male: | | | | | | | | | | | | | | |
| 12 to 14 yr..... | 5.85 | 3.84 | .40 | 3.02 | .54 | 2.46 | 1.95 | 5.01 | 1.62 | 1.08 | 2.10 | 1.44 | .95 | .46 |
| 15 to 19 yr..... | 5.67 | 3.35 | .37 | 3.59 | .47 | 2.58 | 2.55 | 5.49 | 1.31 | 1.33 | 2.53 | 1.72 | .97 | .43 |
| 20 to 54 yr..... | 2.98 | 3.12 | .31 | 4.13 | .56 | 2.67 | 2.43 | 5.74 | 1.20 | 1.24 | 2.33 | 1.61 | .78 | .41 |
| 55 yr and over..... | 2.57 | 3.75 | .20 | 3.74 | .70 | 2.38 | 2.04 | 5.55 | 1.40 | .96 | 1.88 | 1.27 | .72 | .44 |
| Female: | | | | | | | | | | | | | | |
| 12 to 19 yr..... | 4.41 | 3.90 | .34 | 1.96 | .59 | 2.54 | 1.50 | 6.02 | 1.68 | .91 | 1.63 | .90 | .67 | .30 |
| 20 to 54 yr..... | 2.05 | 5.31 | .28 | 2.52 | .73 | 2.85 | 1.58 | 5.43 | 1.53 | .80 | 1.60 | .78 | .62 | .29 |
| 55 yr and over..... | 2.52 | 4.36 | .11 | 2.49 | .60 | 2.64 | 1.31 | 4.99 | .93 | .75 | 1.22 | .93 | .57 | .33 |
| Pregnant..... | 4.11 | 4.50 | .30 | 2.95 | .83 | 3.28 | 1.83 | 5.98 | .95 | 1.16 | 1.73 | 1.19 | .77 | .37 |
| Nursing..... | 3.88 | 3.73 | .25 | 3.62 | .81 | 3.51 | 2.03 | 6.37 | 1.10 | 1.20 | 2.00 | 1.36 | .83 | .39 |

¹ Amounts of food as purchased or brought into the kitchen from garden or farm.² Recommended dietary allowance plus 5 percent for energy, vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium, and iron. Energy intake is distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.³ Food consumption in terms of food groups defined as option 1. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) drippings and all separable fat from meat are discarded, and the amounts of meats, poultry, and fish are adjusted to $\frac{1}{2}$ meat and $\frac{1}{2}$ poultry and fish; (2) milk and dairy products are replaced by their calcium equivalent in skim milk; (3) butter and margarine are replaced by soft margarine, and lard and vegetable shortenings are replaced by vegetable oils.⁴ Weight in terms of dry beans and peas, shelled nuts, and peanut butter.

TABLE 6.—CHANGE IN FOOD CONSUMPTION PATTERNS¹ FOR 14 SEX-AGE CATEGORIES REQUIRED TO MEET THE GOALS AND THE RDA,² OPTION 1
[In percent]

| Food group | Child | | | | | Male | | | | | Female | | | | |
|------------------------------------|-----------------|------------|------------|------------|----------------|-----------------|-----------------|-----------------|--------------------|--|-----------------|-----------------|--------------------|----------|---------|
| | 7 mo to 1 yr | 1 to 2 yrs | 3 to 5 yrs | 6 to 8 yrs | 9 to 11 yrs | 12 to 14 yrs | 15 to 19 yrs | 20 to 54 yrs | 55 yrs and over | | 12 to 19 yrs | 20 to 54 yrs | 55 yrs and over | Pregnant | Nursing |
| Milk, cheese, ice cream | -12 | -24 | 4 | 12 | 12 | 13 | 14 | 12 | 11 | | 16 | -2 | 38 | 64 | 43 |
| Eggs | -100 | 6 | 2 | -12 | -8 | -11 | -41 | -57 | -47 | | 13 | 17 | -4 | -18 | -37 |
| Dry beans and peas, nuts | -73 | 36 | 14 | -1 | 4 | 2 | 8 | 12 | 13 | | 41 | 56 | 1 | 42 | 9 |
| Meat, poultry, fish | -100 | -73 | -19 | -22 | -16 | -19 | -20 | -21 | -12 | | -41 | -33 | -20 | -35 | -27 |
| Dark-green, deep-yellow vegetables | 44 | 73 | 29 | 22 | 21 | 22 | 23 | 22 | 18 | | 59 | 55 | 27 | 47 | 32 |
| Citrus fruit, tomatoes | 55 | 41 | 23 | 30 | 29 | 30 | 32 | 31 | 25 | | 29 | 25 | 18 | 21 | 20 |
| Potatoes | 77 | 37 | 26 | 22 | 21 | 21 | 22 | 21 | 17 | | 33 | 32 | 16 | 22 | 19 |
| Other vegetables, fruit | 53 | 49 | 24 | 76 | 73 | 85 | 95 | 105 | 76 | | 193 | 220 | 53 | 64 | 76 |
| Cereal, pasta | 141 | 292 | 93 | 62 | 60 | 69 | 78 | 85 | 62 | | 80 | 70 | 74 | 105 | 96 |
| Flour, mixes | 98 | 60 | 42 | 47 | 47 | 54 | 61 | 67 | 50 | | 59 | 63 | 41 | 47 | 58 |
| Bread | 67 | 66 | 37 | 33 | 30 | 33 | 35 | 37 | 25 | | -2 | -4 | 20 | 21 | 21 |
| Other bakery products | 156 | -15 | 15 | 42 | 33 | 15 | 1 | 18 | -8 | | 17 | -2 | 1 | 3 | 1 |
| Fats, oils | 735 | 5 | 56 | 42 | 64 | -63 | -62 | -55 | -52 | | -69 | -62 | -53 | -60 | -67 |
| Sugar sweets | 29 | -58 | -59 | -61 | -64 | | | | | | | | | | |

¹ Food consumption in terms of food groups defined as option 1. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) drippings and all separable fat from meat are discarded, and the amounts of meats, poultry, and fish are adjusted to $\frac{1}{2}$ meat and $\frac{1}{2}$ poultry and fish; (2) milk and dairy products are replaced by their calcium equivalent in skim milk; (3) butter and margarine are replaced by soft margarine, and lard and vegetable shortening are replaced by vegetable oils.

² Recommended dietary allowance plus 5 percent for energy, vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium, and iron. Energy intake is distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate, and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mgs per day plus 5 percent.

TABLE 7.—FOOD ENERGY FOR A DAY BY FOOD AND NUTRIENT SOURCE: FOOD CONSUMPTION PATTERN AND DIET MODIFIED TO MEET THE GOALS AND THE RDA,¹
OPTION 1: FOR THE MAN 20-54 YEARS OF AGE

[In calories]

| Food group | Total | | Carbohydrate | | Protein | | Fat | | Sugar | |
|----------------------------------|------------------------|------------------|------------------------|------------------|------------------------|------------------|------------------------|------------------|------------------------|------------------|
| | Consumption pattern | Modified diet | Consumption pattern | Modified diet | Consumption pattern | Modified diet | Consumption pattern | Modified diet | Consumption pattern | Modified diet |
| Milk, cheese, ice cream..... | 264 | 144 | 79 | 80 | 55 | 57 | 130 | 7 | 14 | --- |
| Eggs..... | 83 | 36 | 2 | 1 | 27 | 12 | 54 | 23 | --- | --- |
| Dry beans and peas, nuts..... | 89 | 99 | 30 | 34 | 16 | 18 | 43 | 47 | 3 | 3 |
| Meat, poultry, fish..... | 557 | 349 | 9 | 7 | 200 | 154 | 348 | 188 | --- | --- |
| Vegetables fruit..... | 324 | 403 | 266 | 329 | 28 | 35 | 30 | 39 | 22 | --- |
| Cereal, pasta..... | 138 | 284 | 117 | 239 | 14 | 30 | 7 | 15 | 9 | 26 |
| Flour, mixes..... | 159 | 294 | 131 | 243 | 16 | 29 | 12 | 22 | 12 | 19 |
| Bread..... | 240 | 400 | 183 | 306 | 32 | 53 | 25 | 41 | 17 | 29 |
| Other bakery products..... | 257 | 352 | 158 | 216 | 19 | 26 | 80 | 110 | 52 | 72 |
| Fats, oils..... | 464 | 359 | 5 | 6 | 1 | 1 | 458 | 352 | --- | --- |
| Sugars, sweets, soft drinks..... | 270 | 127 | 257 | 121 | 2 | 1 | 11 | 5 | 260 | 122 |
| Coffee, tea, cocoa..... | 23 | 12 | 20 | 11 | 1 | --- | 2 | 1 | 8 | 4 |
| Total ² | 2,868 | 2,859 | 1,257 | 1,593 | 411 | 416 | 1,200 | 850 | 398 | 297 |

¹ Recommended dietary allowance plus 5 percent for energy, vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium, and iron. Energy intake is distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mgs per day plus 5 percent.

² Food consumption in terms of food groups defined as option 1. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) drippings and all separable

fat from meat are discarded, and the amounts of meats, poultry, and fish are adjusted to 1½ meat and 1½ poultry and fish; (2) milk and dairy products are replaced by their calcium equivalent in skim milk; (3) butter and margarine are replaced by soft margarine, and lard and vegetable shortening are replaced by vegetable oils.

³ Energy values in this table were calculated using grams of carbohydrate, protein, and fat, and the average energy factors of 4, 4, and 9 kg calories, respectively; therefore, the total energy per day may not total exactly to the energy goal for the man—2,700 calories plus 5 percent.

TABLE 8.—A DAY'S FOOD, AS SERVED, IN DIETS MODIFIED TO MEET THE GOALS BUT NOT NECESSARILY THE RDA,¹ AND FURTHER MODIFIED TO MEET THE RDA,² OPTION 1

| Food ³ and unit | Meet goals, not necessarily RDA | | | | Meet goals and RDA: female, 20 to 54 yr |
|---|----------------------------------|-----------------------------------|-----------------------------------|------------------------|---|
| | Child, 6 to 8 yr ⁴ | Child, 9 to 11 yr ⁴ | Male, 20 to 54 yr ⁴ | Female, 20 to 54 yr | |
| Skim milk (cup)..... | 2.9 | 3.3 | 1.7 | 1.3 | 1.2 |
| Eggs (number per week)..... | 2.8 | 3.7 | 3.1 | 4.3 | 5.3 |
| Mature beans or peas, cooked (table- spoon)..... | 1.9 | 2.1 | 2.0 | 1.3 | 1.8 |
| Meat, boned cooked lean (ounce)..... | 1.3 | 1.8 | 2.7 | 2.2 | 1.6 |
| Poultry and fish, cooked boned (ounce)..... | 1.1 | 1.5 | 2.3 | 1.9 | 1.4 |
| Vegetables and fruit (cup)..... | 2.0 | 2.5 | 2.6 | 2.3 | 2.5 |
| Cereal, pasta (ounce ⁵)..... | 2.9 | 3.4 | 2.7 | 2.1 | 3.5 |
| Bread or equivalent in bakery products (slices)..... | 7.8 | 10.1 | 12.9 | 8.6 | 8.0 |
| Margarine, oil (tablespoon)..... | 3.4 | 4.1 | 3.6 | 2.5 | 2.9 |
| Sugar, sweets (tablespoon)..... | 6.0 | 7.0 | 6.7 | 4.7 | 4.7 |

¹ Recommended dietary allowance (RDA) plus 5 percent for energy distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate, and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.

² RDA plus 5 percent for vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium, and iron.

³ The assortment of meats, vegetables, and other groups of foods is based on food consumption of U.S. households in 1965-66.

⁴ Diet modified to meet the goals also meets the RDA for the 5 vitamins and 2 minerals studied.

⁵ 1 serving is approximately 1 oz of dry cereal.

TABLE 9.—CHANGE IN FOOD CONSUMPTION PATTERNS¹ REQUIRED TO MEET THE GOALS AND THE RDA,² OPTION 1, WHEN THE USE OF GRAIN PRODUCTS IS HELD AT LEVELS IN THE PATTERNS

| Food group | [In percent] | | | | |
|---|-------------------------|--------------------------|--------------------------|----------------------------|---------------------|
| | Child, 6 to 8 yrs | Child, 9 to 11 yrs | Male, 20 to 54 yrs | Female, 20 to 54 yrs | Person ³ |
| Milk, cheese, ice cream..... | 45 | 46 | 61 | -10 | 32 |
| Eggs..... | -41 | -33 | -32 | 36 | -8 |
| Dry beans and peas, nuts..... | 209 | 221 | 320 | 568 | 353 |
| Meat, poultry, fish..... | -67 | -57 | -51 | -55 | -53 |
| Dark-green, deep-yellow vegetables..... | 98 | 98 | 123 | 273 | 167 |
| Citrus fruit, tomatoes..... | 90 | 89 | 110 | 111 | 104 |
| Potatoes..... | 163 | 162 | 207 | 112 | 165 |
| Other vegetables, fruit..... | 93 | 92 | 115 | 147 | 119 |
| Cereal, pasta..... | 0 | 0 | 0 | 0 | 0 |
| Flour, mixes..... | 0 | 0 | 0 | 0 | 0 |
| Bread..... | 0 | 0 | 0 | 0 | 0 |
| Other bakery products..... | 0 | 0 | 0 | 0 | 0 |
| Fats, oils..... | 33 | 27 | -31 | -37 | -18 |
| Sugar, sweets..... | -56 | -59 | -44 | -62 | -54 |

¹ Food consumption in terms of food groups defined as option 1. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) drippings and all separable fat from meat are discarded, and the amount of meats, poultry, and fish are adjusted to $\frac{1}{2}$ meat and $\frac{1}{2}$ poultry and fish; (2) milk and dairy products are replaced by their calcium equivalent in skim milk; (3) butter and margarine are replaced by soft margarine, and lard and vegetable, shortening are replaced by vegetable oils.

² Recommended dietary allowance plus 5 percent for energy, vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium, and iron. Energy intake is distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate, and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.

³ Food consumption patterns and modified diets for 14 sex-age categories weighted by the 1975 U.S. population.

TABLE 10.—CHANGE IN 1965-66 FOOD CONSUMPTION PATTERNS¹ REQUIRED TO MEET THE GOALS AND THE RDA
OPTION 1¹ AND CHANGE IN THE NATIONAL PER CAPITA FOOD SUPPLY FROM 1965 TO 1975

[In percent]

| Food | Change in 1965-66 consumption to meet goals | Change in food supply 1965 to 1975 |
|---|--|---|
| Milk | 10 | -8 |
| Eggs | -24 | -11 |
| Dry beans and peas, nuts | 21 | 1 |
| Beef, pork, veal, lamb | -48 | 7 |
| Poultry, fish | 40 | 5 |
| Potatoes | 27 | 5 |
| Other vegetables, fruit | 24 | 7 |
| Wheat, corn, oats, rice, and other grains | 69 | -4 |
| Butter | ² 100 | -25 |
| Lard | ² 100 | -53 |
| Margarine | 52 | 13 |
| Vegetable shortening | ² 100 | 23 |
| Oils | 73 | 44 |
| Sugar, sirups ³ | -32 | 3 |

¹ The 1965-66 food consumption patterns for men, women, and children were modified to meet the goals and the RDA using assumptions defined as option 1, and weighted by the 1975 population.

² Replaced by margarine and oils, which are higher in polyunsaturated fatty acids.

³ Includes sugar in commercially prepared foods, such as ready-to-eat cereals, canned fruit sirup, and bakery products

TABLE 11.—CHANGE IN FOOD CONSUMPTION PATTERNS¹ REQUIRED TO MEET THE GOALS AND THE RDA,²
OPTION 2

[In percent]

| Food group | Child, 6 to 8 yrs | Child, 9 to 11 yrs | Male, 20 to 54 yrs | Female, 20 to 54 yrs | Person ³ |
|------------------------------------|----------------------|-----------------------|-----------------------|-------------------------|---------------------|
| Milk, cheese, ice cream | -12 | -10 | 4 | 4 | 1 |
| Eggs | -18 | -18 | -64 | 5 | -33 |
| Dry beans and peas, nuts | 56 | 58 | 17 | 44 | 35 |
| Meat, poultry, fish | -22 | -16 | -23 | -33 | -26 |
| Dark-green, deep-yellow vegetables | 19 | 18 | 18 | 53 | 31 |
| Citrus fruit, tomatoes | 16 | 15 | 16 | 21 | 17 |
| Potatoes | 26 | 24 | 28 | 17 | 22 |
| Other vegetables, fruit | 16 | 15 | 16 | 26 | 19 |
| Cereal, pasta | 108 | 102 | 116 | 207 | 129 |
| Flour, mixes | 81 | 77 | 92 | 79 | 84 |
| Bread | 68 | 65 | 73 | 60 | 64 |
| Other bakery products | 5 | 5 | 37 | -10 | 13 |
| Fats, oils | -39 | -38 | -49 | -34 | -42 |
| Sugar, sweets | -69 | -71 | -62 | -65 | -66 |

¹ Food consumption in terms of food groups defined as option 2. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) drippings and all separable fat from meat are discarded; (2) milk is replaced by 2 percent fat milk; (3) butter is replaced by margarine, and lard is replaced by vegetable shortening.

² Recommended dietary allowance plus 5 percent for energy, vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium and iron. Energy intake is distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate, and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.

³ Food consumption patterns and modified diets for 14 sex-age categories weighted by the 1975 U.S. population.

TABLE 12.—CHANGE IN FOOD CONSUMPTION PATTERNS¹ REQUIRED TO MEET THE GOALS AND THE RDA,² OPTION 3

[In percent]

| | Child, 6 to 8 yr | Child 9 to 11 yr | Male, 20 to 54 yr | Female, 20 to 54 yr | Person ³ |
|---|---------------------|---------------------|----------------------|------------------------|---------------------|
| Milk, cheese, ice cream..... | -13 | -12 | -10 | 3 | -0 |
| Eggs..... | -15 | -15 | -65 | 0 | -31 |
| Dry beans and peas, nuts..... | 71 | 73 | 88 | 60 | 73 |
| Meat, poultry, fish..... | -32 | -26 | -26 | -37 | -33 |
| Dark-green, deep-yellow vegetables..... | 16 | 15 | 17 | 55 | 31 |
| Citrus fruit, tomatoes..... | 13 | 13 | 14 | 18 | 15 |
| Potatoes..... | 25 | 24 | 27 | 15 | 21 |
| Other vegetables, fruit..... | 14 | 13 | 14 | 24 | 17 |
| Cereal, pasta..... | 119 | 114 | 124 | 214 | 141 |
| Flour, mixes..... | 89 | 86 | 96 | 93 | 94 |
| Bread..... | 75 | 72 | 80 | 67 | 72 |
| Other bakery products..... | 17 | 16 | 21 | -12 | 8 |
| Fats, oils..... | -82 | -81 | -70 | -56 | -71 |
| Sugar, sweets..... | -71 | -73 | -59 | -65 | -66 |

¹ Food consumption in terms of food groups defined as option 3. Average selections within food groups as used by U.S. households in 1965-66 are assumed except drippings and $\frac{1}{2}$ of the separable fat from meat are discarded.

² Recommended dietary allowance plus 5 percent for energy, vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium, and iron. Energy intake is distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate, and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.

³ Food consumption patterns and modified diets for 14 sex-age categories weighted by the 1975 U.S. population.

TABLE 13.—CHANGE IN FOOD CONSUMPTION PATTERNS REQUIRED TO MEET THE GOALS AND THE RDA,¹ OPTION 4²

[In percent]

| Food group | Child, 6 to 8 yr | Child, 9 to 11 yr | Male, 20 to 54 yr | Female, 20 to 54 yr | Person ³ |
|---|---------------------|----------------------|----------------------|------------------------|---------------------|
| Milk, cheese, ice cream..... | 26 | 27 | 47 | 30 | 34 |
| Eggs..... | 17 | 21 | -51 | 35 | -7 |
| Dry beans and peas, nuts..... | 16 | 23 | 19 | 88 | 39 |
| Meat, poultry, fish..... | 7 | 13 | 6 | -29 | -6 |
| Dark-green, deep-yellow vegetables..... | 31 | 31 | 43 | 92 | 63 |
| Citrus fruit, tomatoes..... | 32 | 31 | 35 | 49 | 40 |
| Potatoes..... | 34 | 34 | 37 | 41 | 35 |
| Other vegetables, fruit..... | 31 | 31 | 36 | 56 | 44 |
| Grain ⁴ | 45 | 44 | 54 | 138 | 74 |
| Fats, oils..... | 91 | 81 | 38 | -53 | 22 |
| Sugar, sweets..... | -21 | -22 | 8 | -15 | -10 |

¹ Recommended dietary allowance plus 5 percent for energy, vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium, and iron. Energy intake is distributed as 30 percent or less from fat, 14 percent or less from protein, 56 percent or more from carbohydrate, and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.

² Food in terms of food groups defined in option 4. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) amounts of meat, poultry, and fish are adjusted to $\frac{1}{2}$ good grade beef rump roast and $\frac{1}{2}$ chicken broiler and all drippings and separable fat from the roast and drippings and skin from the chicken are discarded, (2) milk and dairy products are replaced by their calcium equivalent in skim milk, (3) butter and margarine are replaced by soft margarine, and lard and vegetable shortening are replaced by vegetable oils; (4) grain products are replaced by their grain equivalent in rice— $\frac{1}{2}$ raw brown and $\frac{1}{2}$ white enriched parboiled rice.

³ Food consumption patterns and modified diets for 14 sex-age categories weighted by the 1975 U.S. population.

⁴ The amount of cereal in the consumption pattern is the grain equivalent of the 4 grain products food groups. Other ingredients in grain products, such as fat and sugar, are excluded from the consumption pattern.

TABLE 14.—CHANGE IN FOOD CONSUMPTION PATTERNS¹ REQUIRED TO MEET THE GOALS, WITH 12 PERCENT OF ENERGY FROM PROTEIN (BASED ON DISAPPEARANCE DATA), AND THE RDA,² OPTION 1

[In percent]

| Food group | Child, 6 to 8 yr | Child, 9 to 11 yr | Male, 20 to 54 yr | Female, 20 to 54 yr | Person ³ |
|---|---------------------|----------------------|----------------------|------------------------|---------------------|
| Milk, cheese, ice cream..... | 5 | 5 | 6 | -9 | 3 |
| Eggs..... | -43 | -39 | -40 | 6 | -27 |
| Dry beans and peas, nuts..... | -38 | -34 | -25 | 50 | -10 |
| Meat, poultry, fish..... | -63 | -58 | -55 | -71 | -61 |
| Dark-green, deep-yellow vegetables..... | 24 | 23 | 23 | 72 | 40 |
| Citrus fruit, tomatoes..... | 26 | 24 | 24 | 32 | 25 |
| Potatoes..... | 36 | 34 | 36 | 28 | 32 |
| Other vegetables, fruit..... | 25 | 23 | 23 | 40 | 29 |
| Cereal, pasta..... | 99 | 95 | 126 | 291 | 157 |
| Flour, mixes..... | 81 | 78 | 103 | 89 | 92 |
| Bread..... | 56 | 54 | 74 | 74 | 64 |
| Other bakery products..... | 43 | 40 | 48 | -11 | 25 |
| Fats, oils..... | 68 | 59 | -1 | 9 | 17 |
| Sugar, sweets..... | -65 | -67 | -60 | -66 | -63 |

¹ Food consumption in terms of food groups defined as option 1. Average selections within food groups as used by U.S. households in 1965-66 are assumed except (1) drippings and all separable fat from meat are discarded, and the amounts of meats, poultry, and fish are adjusted to $\frac{1}{2}$ meat and $\frac{1}{2}$ poultry and fish; (2) milk and dairy products are replaced by their calcium equivalent in skim milk; (3) butter and margarine are replaced by soft margarine, and lard and vegetable shortening are replaced by vegetable oils.

² Recommended dietary allowance plus 5 percent for energy, vitamin A value, thiamin, riboflavin, niacin, ascorbic acid, calcium, and iron. Energy intake is distributed as 30 percent or less from fat, 12 percent or less from protein, 58 percent or more from carbohydrate, and 10 percent or less from sugar other than that found naturally in foods such as milk and fresh fruit. Saturated fat provides 10 percent or less of energy intake and cholesterol intake is limited to no more than 300 mg per day plus 5 percent.

³ Food consumption patterns and modified diets for 14 sex-age categories weighted by the 1975 U.S. population.

**U.S. OUTLOOK IN
WORLD PERSPECTIVE**

THE WORLD FOOD ECONOMY: A DEVELOPED COUNTRY VIEW

(By Geoff Miller, Director, Bureau of Agricultural Economics, Canberra, Australia)

In my remarks to you this evening, I have been asked to take up some of the issues raised in Lynn Daft's paper "From a developed country viewpoint." This is no mean assignment for an Australian. Developed country agriculture is characterized by policies aimed at domestic self-sufficiency in food supplies, and income support for producers. A by-product of these policies is periodic surpluses and deficits. These fluctuations are responsible for much of the instability in world trade. As a result of unstable markets and access difficulties, many Australian rural industries are contracting despite the abundant supply of resources available for farm production.

Even an Australian from an objective and professionally independent an agency as the Bureau of Agricultural Economics, would find it difficult to view the emerging world agricultural situation from "a developed country viewpoint." There are too many conflicts between current practice and economic rationality for me to act as a spokesman for developed country agriculture. But nor would I wish at this Conference to argue a partisan Australian position.

Both the Universal Declaration on the Eradication of Hunger and the recent U.S. Academy of Sciences World Food and Nutrition Study support the proposition that we have the physical resources and know-how to deal with the world food problem. Many have concluded that all that is needed is the political will.

In a sense this conclusion is a correct one. But in a very important sense it is not. In a moment I shall explain this contradiction but let us first break the world food problem up into two parts.

ADEQUACY OF SUPPLIES

One part is the adequacy of world food supplies and the capacity of the world to feed the impoverished and undernourished. The other part, identifiably separate though related, is the question of world food security. I'll come back to the food security issue in a moment or two.

The world most certainly has the capacity to feed itself. Malthus was wrong, is wrong and will remain wrong. Unfortunately his hypothesis will continue to be revisited by pseudointellectual writers—people seeking a quick way to fame and fortune in the publication world. These people make a brief (even if sometimes intellectually brilliant) stopover in an area too complex to be understood in even an extended and serious investigation.

Such writings usually appear at times of temporary food shortage. The unfortunate part about them is that they galvanise public attitudes, so that any increase in the incentive to produce food is seen as a good thing. In fact these periodic surges in food production incentives generate, a few years later, surpluses that disillusion both producers and policymakers. Thus the seeds for the next shortage are sown.

The 3.8 billion people in the world in 1973 had 21 percent more food per person than the 2.7 billion inhabiting the globe in 1954. During this period food production grew at an average annual rate of 2.8 percent. So we are making progress. The problem with adequacy of food supplies is that if you express these figures on a per capita basis, there was an enormous disparity in the rate of growth in supplies in developed and developing countries. Per capita supplies increased at 1.5 percent in the developed countries, but only 0.4 percent in the developing countries. It is, of course, relevant that most of the difference was attributable to different rates of population growth.

Nevertheless there has been and will continue to be a steady improvement in the overall adequacy of food supplies. The problem is in the distribution of the benefits. This is an extremely important humanitarian problem. It involves not only stimulating the growth in agricultural production in the less developed countries, but stimulating the rate of economic development itself.

Given the political will to pay, there is no doubt that we could substantially increase the rate of food production growth in the developing countries. Many of the measures taken in the aftermath of the World Food Conference will certainly assist in dealing with this fundamental long-term problem.

But let us not forget that the problem of human poverty and undernutrition is not just a question of increased food production. It is a process of economic and social transformation of whole nations of people. The political will must indeed be strong.

WORLD FOOD SECURITY

World food security has to do with fluctuations in the availability of supplies. There I think we are lacking in more than political will. What we have is a world of nation states, or blocs of nation states, each pursuing its own domestic farm policies for essentially its own domestic reasons. Then the individual surpluses or deficits generated by these policies are left to the world market to accommodate. Countries are like subsistence farmers—they meet their own needs from their own resources until something goes wrong.

I don't think we can legitimately blame individual countries for pursuing the goal of food security through striving for self-sufficiency. Adequate food supplies on a reliable basis are something we in the food surplus countries take for granted. I think the premium that consumers in Western Europe and Japan pay for food security—basically through paying high enough prices to ensure self-sufficiency—is as much a measure of failure of the international commodity trading system as it is a reflection of the political power of their producers. If consumers in these countries could be shown an alternative way to reliable and secure food supplies, the power of the producer lobby would be considerably weakened.

If developed food deficit countries are not confident that they can obtain food security through trade, small wonder the developing countries feel disillusioned. Countries responsible for abrupt shifts in demand and supply in world markets pay no price for the costs they impose on others. Countries who are regular and stable suppliers or reliable buyers receive no premium. Indeed, our residual world markets for agricultural products are as good an example of market failure as the failure of our domestic price mechanisms to charge for the externalities involved in pollution and environmental degradation.

If mankind is to obtain the enormous benefits potentially available from increased specialisation and trade in agricultural products, new economic institutions will be needed. By that I do not mean new international bureaucracies. Of course, efforts are currently being made, through the multilateral trade negotiations, to break down some of the barriers to international trade in farm producers. Efforts are also being made to regulate trade in sugar and grains through the negotiation of international commodity agreements.

My own view is that these efforts are more an expression of political will, galvanised by the food crisis of 1973, than of the realisation of new insights into how to regulate and stabilize trade. The commodity agreements are a worthwhile endeavour, but unfortunately they are doomed to a difficult future. Agreements so far negotiated, or advanced as a basis for negotiation, are characterised by many of the same rigidities that characterise most countries' domestic farm policies.

Efforts are being made to fix prices, markets shares and stock levels at arbitrary historically predetermined levels, rather than to provide a framework within which the dynamic economic forces of the world food economy can express themselves. Even bilateral agreements of this type encounter difficulties, such as those recently experienced in relation to the pricing provisions of the sugar agreement between Australia and Japan. In a multilateral framework, the difficulties are greatly compounded.

In world commodity markets the individual decisionmaking unit is a country or large multinational corporation. Subject to some qualification, existing market mechanisms work reasonably well in short term (within crop year) pricing. But they work very poorly at the longer term end. What is needed is a dynamic institutional framework within which contracts can be negotiated and prices established with sufficient reliability to encourage major long-term investment in productive capacity and storage.

The longer term price mechanism needs to provide the incentive for appropriate stocks and trade volumes to be established and adjusted by the individual decisionmaking units (producing and consuming countries) rather than set these variables at historical or arbitrary levels. Volumes of trade need to be "normalised" without being straightjacketed. Countries who use the world market as a dumping ground for surpluses generated by too rigid domestic policies, or as a source of supplies to substitute for inadequate local storage, must be given incentives to desist.

Efforts are being made to integrate some dynamic elements into commodity agreements and I have no doubt that emerging agreements

have the potential to surpass their predecessors. Nevertheless if we are to obtain more permanent good security through these arrangements, many more rigidities are yet to be removed from both the structure of domestic price policies and the format of international institutional arrangements.

Let me conclude, Mr. Chairman, by saying that future world food security requires something more than political will, statesmanship and negotiating skills. These things are necessary but not sufficient. A more concerted and fundamental scientific endeavour in the policy development field is also necessary. The issues are extremely complex and solutions will not be unearthed quickly or simply. However, I believe that we have now developed some useful ideas on where to begin.

Without underestimating the difficulties, I hope that the work being embarked upon will yield dividends in the next few years. In the meantime, world food security must remain heavily dependent on self-sufficiency in individual countries; on the stocks accumulated largely as a byproduct of domestic agricultural policies; on the still too rigid fabric of such international regulatory mechanisms as are negotiable; and on a liberal dose of good luck! This is unsatisfactory for hungry people, for efficient farmers in food exporting countries and ultimately for mankind.

THE U.S. ECONOMIC OUTLOOK IN WORLD PERSPECTIVE

(By Lyle E. Gramley, Member, Council of Economic Advisers)

I'm delighted to be here this morning to talk with you briefly about the outlook for economic activity in the United States.

I'd like to begin by reviewing some of the things that have been happening in the U.S. economy during the course of 1977 by way of providing a backdrop for probable developments next year. We got off to a very fast start this year in terms of the growth rate of economic activity. During the first half, our real gross national product increased at an annual rate of $6\frac{3}{4}$ percent. That large increase reflected, in part, a rise in inventory investment from a very low level at the close of 1976 to approximately a normal level in relation to gross national product by the middle of this year. That source of stimulus is of necessity of a temporary character. Therefore, some slowdown in the pace of growth appeared to almost all forecasters inevitable.

The actual slowdown that has occurred, however, has exceeded our expectations in terms of both duration and magnitude. During the third quarter, the real gross national product increased at a rate of only 3.8 percent, a rate of growth approximately in line with our long-run potential. This slowdown in the rate of expansion was reflected in a number of other measures as well. For example, during the 3 months from June to September, industrial production in our country went up at an annual rate of approximately 3 percent. That compares with a rate of increase from December to June of approximately 7 percent. And the unemployment rate has been approximately flat at 7 percent since last April. Our economy has been growing fast enough to keep the unemployment rate from rising and absorb new entrants into the labor force, but not enough to make progress of the kind we want in getting the unemployment rate down.

What, besides the slowdown in inventory investment, explains why our economy has been behaving relatively sluggishly recently? I think there are several elements. First, the pace of consumer spending has been relatively sluggish since the first quarter. In real terms, personal consumption expenditures have gone up much less than disposable income. Or to put it another way, the rate of personal savings relative to disposable income has risen quite sharply.

This would be a worrisome development if it reflected a basic weakening of consumer spending propensities. Fortunately, however, this does not appear to be the case. For example, attitudinal surveys taken by the Michigan Survey Research Center or the Conference Board indicate that consumer attitudes have deteriorated a little during the course of the spring and the summer but indices of confidence are about as high this fall as they were last spring. And the expansion of con-

sumer installment credit and the pace of housing and auto sales confirm that consumers are still buying durable goods relatively freely. They are still increasing their purchases of homes. They are still expanding their installment debts.

What then accounts for the rise in the personal savings rate and the associated slowdown in consumer spending? It is mainly the fact that during the first 2 years of the recovery the savings rate went down to unusually low levels. It was driven down even further by special factors during the first quarter of this year, such as the cold weather which generated large fuel bills. During that quarter, the rate of personal savings relative to disposable income was just barely over 4 percent, the lowest figure for any quarter since 1951. Some rebound in that savings rate was therefore inevitable. Consumer spending simply had to slow down.

A second factor in the sluggish pace of economic activity has been the response of businesses to the weakening pace of consumer spending. In the past, businesses typically have waited awhile to appraise new developing trends in consumer spending rather than reacting immediately. Consequently, a reduced pace of consumer spending has typically been reflected in a rise in the rate of inventory investment—which has tended to buffer rates of production and the level of employment from the effects of changes in the pace of consumer spending. That did not happen last year when consumer spending slowed. And it did not happen again this year. Businesses are pursuing extremely cautious inventory policies and they have begun to make their adjustments in production immediately upon perceiving some change in the pace of consumer spending. This has some good aspects and some bad aspects. The bad aspects are that changes in the pace of consumer spending are reflected strongly and quickly in production, and therefore, in employment, in consumer incomes, and in buying power. This tends to magnify the initial response of consumer spending.

The good aspect is that businesses this year, as last, have kept their inventory-to-sales ratios in good order. An undesired buildup of inventories has not occurred. Inventories are still relatively lean so that when a pickup in consumer spending begins again, one may anticipate that, as we saw in the late months of 1976, a prompt rise in production and employment in response to the improved pace of consumer sales.

A third factor in the relatively disappointing performance of our economy in the past couple of quarters has been the continuing drag exerted by our foreign trade position. In the third quarter of 1976, we enjoyed a surplus of net exports of goods and services of about \$8 billion. By the third quarter of this year, our trade position had switched markedly. Net exports of goods and services, as we measure them in the gross national product accounts, were in deficit to the extent of about \$12 billion. That switch from an \$8 billion surplus to a \$12 billion deficit is a drain of \$20 billion of income that goes abroad. It acts, in effect, like an increase in taxes of \$20 billion in terms of its effects on consumer purchasing power.

The reasons for this continued movement towards deficit of our international trade position are quite well known. A major factor is that oil imports are still very large. Another important factor, however, has been the very sluggish pace of our exports, reflecting the dis-

appointing recovery abroad. In general, most industrialized countries have experienced even greater disappointment this year with the performance of their economies than we have. In particular, the pace of business investment has been sluggish worldwide and since we tend to be a heavy exporter of capital goods, that has taken its toll on our export position.

A fourth factor in the performance of the economy this year has been some weakening in the rise of business investment. For example, between the second and third quarters, production of business equipment rose at an annual rate of only about 7 percent. That's about half the rate of increase that occurred from the fourth quarter of 1976 to the second quarter of this year.

More worrisome even than the slowdown in the actual pace of business fixed investment has been some evidence that perhaps businesses are planning more cautiously for the future than they were earlier this year. Orders for nondefense capital goods have been behaving erratically in recent months but on balance they were a little lower in the third quarter of this year, in current dollar terms, than they were in the second quarter. In real terms—after adjusting for price changes—orders were down significantly. Moreover, private surveys of business spending plans for next year suggest that the rise in business fixed investment outlays during 1978 might be somewhat smaller than it was in 1977.

Reasons for this hesitancy in the prospective pace of business fixed investment are not fully evident. It may be that businesses are uncertain because of the delay of congressional passage of the energy program, particularly those businesses whose investments are critically related to the energy package. It maybe, also, that businesses have become more cautious because they fear the recovery could be faltering given the slowdown in the pace of consumer spending. If those two factors are important, one can make a reasonable case that the hesitancy in business fixed investment planning is more likely to reflect delays or postponement of spending programs than cancellations. That would suggest that we are likely to see some renewed strength building up over the course of 1978.

We, at the Council of Economic Advisers, are still reasonably confident that activity is going to pick up soon and that a better growth rate of economic activity will emerge in statistics of the fourth quarter, for a number of reasons.

First, the stimulus programs, introduced earlier this year by the administration and passed by the Congress, are gathering strength. They will be building up to peak force in the early part of 1978. They are gathering momentum now, will be adding to disposable income in the future, and will help to strengthen the growth of employment and consumer purchasing power.

Second, other governmental expenditures are also rising, particularly defense purchases. The advance indicators of defense purchases began to show strength around the middle of 1976. Actual purchases by the Federal Government began to rise in the second quarter; they showed another good growth in the third quarter, and we anticipate further expansion in the quarters ahead. The Federal pay raise is also adding sizably to disposable income this fall.

Third, the personal saving rate has risen a good deal from its low point at the first of this year. It's now back to a more normal level so that we can reasonably expect that as disposable income rises, personal consumption expenditures will begin to move up again. And with inventories relatively lean, we should see translation of rising consumer spending into increases in production and employment relatively soon.

We can't be sure when the pickup will occur, but recent monthly statistics are consistent with the view that an upturn is fairly close at hand. New orders for durable goods have been rising more strongly recently. The aggregate of hours worked began to move up in September and continued to rise in October. The most heartening sign is that recent figures on retail sales indicate a strengthening trend during the course of the summer months in consumer spending. October retail sales figures were released yesterday. They showed that in the month of October, we had an increase about $1\frac{3}{4}$ percent in total retail sales. From June to October, retail sales rose 12 percent at an annual rate. After allowance for the probable rise of prices, retail sales advanced 5 to 6 percent, a much stronger rate than we have seen since March.

Let me talk just a little bit about price developments thus far in 1977 and then turn to the outlook for 1978. We've had some rather wide variations in the rate of price increase overall this year, but they have been largely due to developments affecting food prices. I would be carrying coals to Newcastle if I tried to tell this group what's been happening to food prices and why, and so I won't try. But let me mention that the food price situation has been extremely important in terms of the overall behavior of the price indexes. For example, the total of consumer prices during the first half of this year rose at an annual rate of 9 percent, but during the third quarter, with food prices at retail rising much more moderately, the consumer price index overall rose at an annual rate of only 4 percent. Not all of that improvement was due to food prices, but a good part of it was. We did, fortunately, see some moderation in components of consumer prices other than food—nonfood commodities and, to some degree, services.

Abstracting from the volatile movements of food and energy prices, however, the underlying inflation rate this year is still hanging in the 6 to $6\frac{1}{2}$ percent range. For example, in September consumer prices excluding food and fuel were 6.1 percent above the year earlier figure. And wholesale prices of industrial commodities, excluding energy items, were 5.9 percent higher in October than a year earlier.

Wage rate increases have also remained about where they were a year ago—at about 7 percent. Nonwage labor costs have been rising somewhat faster than wage rates, so that total compensation per hour worked is rising in the range of 8 to $8\frac{1}{2}$ percent. That means with long-term growth of productivity around 2 percent, the underlying trend of industrial costs is in the 6 to $6\frac{1}{2}$ percent range.

That, of course, is our underlying rate of inflation—6 to $6\frac{1}{2}$ percent. And it has remained there for the past 2 years. There's been no material change in that rate since the middle of 1975. Inability to make progress in reducing the underlying rate of inflation has been a major disappointment. But, at least one can say that the rate is unlikely to change in the near future. In all probability, 1978 will witness a continuation of an underlying rate of inflation in the range of 6 to $6\frac{1}{2}$ percent.

Let me just turn briefly to the outlook for 1978. The last official forecast put out by the administration was released in July. We will not release another official forecast until the one that accompanies the fiscal 1979 budget in January. But our tentative thinking at the Council of Economic Advisers is that we should be able to achieve a real growth rate of somewhere in the range of $4\frac{1}{2}$ to 5 percent for 1978, measured year over year. Such a growth rate, we believe, could be achieved with no new fiscal stimulants other than what the administration has announced up to this time. That would still mean a sizable increase in Federal spending between fiscal year 1977 and fiscal 1978.

The current projection of Federal outlays for fiscal 1978 implies a rise in total outlays of between 13 and 14 percent. A large part of that increase reflects the stimulus programs introduced earlier in 1977, and they will be reaching their maximum potential for stimulating the economy during the first half of calendar 1978. Thereafter, the thrust from those programs will be leveling out.

Our expectations of a $4\frac{1}{2}$ to 5 percent growth rate also assume a relatively accommodative monetary policy. We recognize that short-term interest rates may rise somewhat further, but we anticipate a relatively moderate rise. And if that moderate rise occurs, long-term interest rates will probably remain relatively stable as long as the rate of inflation stays well behaved.

Let me talk just briefly about some of the major sectors of the economy and what we might expect from them during the course of 1978—beginning first with those from which we cannot realistically expect much stimulus.

Consumer spending is, of course, the largest element of our gross national product. Consumers led the recovery for the first 2 years. We can't expect that to continue. The savings rate, though higher than it was at the beginning of this year, is still below what one might consider to be a normal rate. It's at about $5\frac{1}{2}$ percent. A normal rate would be in the range of 6 percent or so. We anticipate, therefore, the possibility of some further rise in the saving rate, so that personal consumption expenditures probably will grow a little less rapidly than disposable income. A rise in real consumer spending in the range of 4 to $4\frac{1}{2}$ percent seems reasonable.

The housing industry has also been a major source of stimulus during the past couple of years. We can't expect that to continue. Single family starts have surpassed earlier peaks, backlogs of demand have been filled, prices of houses are rising very rapidly, interest rates have also moved up somewhat. We probably will see a moderate further rise in residential construction in the next several quarters, but the thrust from that sector will diminish as 1978 goes on.

For net exports, fortunately, we do not expect the drag to continue. We do not expect our net export balance to worsen, but we expect it to remain at somewhere around the 1977 level. We'll probably not see much rise in our oil imports next year. We don't have to rebuild stocks as we did this year following a cold winter. We do have some Alaskan oil production coming in. But, unfortunately, the outlook for our nonagricultural exports is still not very favorable. A number of industrial countries abroad have announced stimulative actions that are likely to result in an improvement in activity during 1978 (relative to 1977), but it will be some time yet before a capital goods boom

develops around the industrial world that would give real life to our exports.

The sectors from which we can expect stimulus next year are two in number. First, governmental spending and second, business fixed investment. For governmental spending, as I indicated, the stimulus programs will be building up. Also, State and local government finances are in better shape now than they were a year or two ago. We would anticipate a rise of governmental spending next year somewhere between 5 and 6 percent in real terms.

If we're going to get the kind of growth we want, however, we've got to have a very strong rise in business fixed investment. Business capital outlays will need to rise somewhere in the range of 7 to 9 percent in real terms in 1978 to achieve the increase of $4\frac{1}{2}$ to 5 percent in real gross national product that we're looking for.

Until the signs of hesitancy that I mentioned earlier became evident, a growth rate of 7 to 9 percent in real business fixed investment looked quite feasible. After all, profits had been rising through the recovery, the financial condition of businesses was and still is quite strong, and rates of capacity utilization have now risen to a point where in the past that had signaled to businesses the need to begin expanding their investment planning. A growth rate of 7 to 9 percent still seems realizable if some of the uncertainties we've seen recently begin to disappear, as we think they will. One helpful factor, I believe, will be the fact that the President will announce at some time fairly soon, after the energy program and Social Security programs have gone through Congress, a tax package that will help to strengthen business fixed investment. Whether or not there will be any direct investment incentives in such a package, such as an increase in the investment tax credit or some accelerated depreciation, is not clear. What is clear is that there will be measures that will be helpful in terms of business fixed investment.

Our view of the outlook for 1978 at the Council of Economic Advisers is a fairly positive one. We see no major imbalances in the recovery process to date. We believe that financial markets, though they are somewhat tighter than they were last spring, remain basically conducive to recovery. With inflation not likely to accelerate, some of the fears of a renewed inflationary outbreak have been allayed. We see no bottlenecks or shortage problems likely to develop to inhibit recovery. And so we think recovery should continue at a reasonably good pace next year.

We recognize, however, that others are somewhat less optimistic than we are. In particular, some forecasters are concerned about the possibility that the pace of economic expansion may slow as 1978 unfolds to an unacceptably low rate by the end of the year.

The administration is cognizant of this potential problem. Over the next few months, the outlook for 1978 will be reassessed. If it appears that we are not moving up during the fourth quarter with the vigor we anticipate, or that the outlook for capital spending is weaker than we think it will be, additional fiscal actions may be needed to reach our growth objectives for next year. Those actions could be most readily incorporated into the President's budget for fiscal year 1979.

TRENDS IN U.S.S.R. AGRICULTURE

(By Dr. Boris A. Runov, Vice-Minister of Agriculture, U.S.S.R.)

Let me tell you briefly about the agriculture of the Soviet Union.

It should be recalled that the agriculture of Tsarist Russia was one of the most backward in Europe. Almost half of all lands were in the hands of a small number of landlords. Thirty percent of all farms had no horses. One-third of the peasant farms did not even have wooden ploughs. The agriculture of prerevolutionary Russia was so backward that starvation was the common phenomenon.

The very day after the victory of the socialist revolution, the decree of the land was accepted. It was the first time in history that Soviet leadership had solved the land problem in the interests of working peasants. As a result of the victory of the great October Revolution, peasants received over 375 million acres of land.

Our country has passed a long and difficult way. Along the way it faced the struggle with foreign invasion. The Soviet people accomplished a great deed in defeating German fascism in heavy battle.

Over the past 60 years the population of the U.S.S.R. has grown 1.7 times. The gross output of agricultural production has increased 4.4 times.

Now there are about 28,000 collective and about 20,000 state farms. These are large, economical strong farms. Collective and state farms account for about 90 percent of total commercial production.

The average size of collective farms is 6,500 hectares. The average size of state farms is 19,000 hectares.

There are over 2.5 million tractors and 1.5 million trucks on the farms. Soviet agriculture now consumes annually 80 billion kilowatt/hours of electricity, almost twice the amount consumed in the country before 1940.

Our objectives are:

First: To provide the country with a steady supply of food and agricultural raw material and to have sufficient reserves of agricultural products;

Second: To make the everyday social and cultural conditions of village and town more equal to each other.

Our most important objective is to increase grain production. The average annual gross production of grain during the 10th 5-year plan (1976-80) should be increased by 35-40 million tons, compared with the 9th 5-year plan (1971-75).

Meat production is planned to be increased at least up to 17.3 million tons; milk, up to 100 million tons; and eggs, up to 67 billion/year. During the current 5-year plan period our agriculture will receive over 170 billion rubles or about 27 percent of total capital investments in the national economy.

What are the resources for increasing of our agricultural production?

Our main resources are placed in fields: new high-yielding varieties, broad application of fertilizers, using minimum tillage, land reclamation. In animal husbandry: improvement of animal breeding, increasing livestock population, and most importantly, improvements in the quality and quantity of our feeding rations.

In the current 5-year plan, agriculture will receive 1.82 million tractors, 1.35 million trucks, 538,000 grain harvesters, and 1.5 times more mineral fertilizers than in the previous 5-year period.

The development of specialization and concentration of agricultural production on the basis of interfarm cooperation and agro-industrial integration will play a great role in increasing our efficiency.

You might know that our specialized hog production operations in unit capacity are up to 100,000 head, and our milking operations are up to 4,000 cows.

Incomes of collective farmers in 5 years will grow by 24 to 27 percent. There will be considerable growth in funds for public needs, which will be used for medical treatment, education, improvement of professional skills, and pensions.

This year, which is far from being the best or even an average one in terms of weather conditions, the U.S.S.R. produced 194 million tons of grain, about 15 million tons of meat, and 8.4 million tons of cotton.

Making a speech at the Jubilee Meeting on the occasion of the 60th anniversary of the October Revolution, Leonid Brezhnev said that our agrarian policy is oriented not only to current needs but also to the future. We are trying to find the solution to the food problem, to satisfy the growing demands of the country, and we are doing this under conditions when the population and its requirements are increasing, but the acreages are the same.

That is why we are planning accelerated, intensive development of all agricultural sectors in the future.

WORLD AND U.S. AGRICULTURAL OUTLOOK

(By J. Dawson Ahalt,* Acting Chairman, World Food and Agricultural Outlook and Situation Board, USDA)

Farmers, consumers, businessmen, and policymakers have become increasingly aware in recent years of the strong interrelationships between United States and global food and agricultural developments. Indeed, these ties were dramatized in the early 1970's. All of us in this room know they have been emphasized again this year.

To improve our understanding of United States and international developments, the Department has strengthened and integrated its outlook work in domestic and international areas. A specific step taken this year was the creation of the World Food and Agricultural Outlook and Situation Board to act as the Department's focal point for commodity outlook situation information. In this role the Board reviews and clears all domestic and international economic commodity intelligence produced by the various agencies in the Department relating to the food and agricultural sector. The goal is to help insure that the public is getting the best possible outlook information given the resources available.

This year the scope of the Outlook Conference has been broadened two ways. First, we have tried to integrate domestic and international developments more clearly than in the past. Second, we have structured the program to bring more closely together agricultural and food issues, because they too cannot be viewed independently. We hope this new slant will strengthen our ability to analyze and present the outlook.

THE SETTING

Global supplies of food and other farm products continued abundant for the coming season for the second consecutive year. Big supplies of grains and increased crops of oilseeds, sugar crops, coffee and cotton have resulted in sharp declines over the past year in world prices of these crops.

Larger food supplies are virtually assured for most areas of the world, despite the recently announced sharp drop in the 1977 Soviet grain crop estimate and some recent deterioration in crop prospects in Canada and Australia. Although food supplies are generally abundant, they are short in parts of Southeast Asia, Africa's Western Sahel, Afghanistan, and Ethiopia.

Bigger world supplies of grains, oilseed, and meals have resulted in severely depressed prices and reduced returns to farmers. Yet people in many parts of the world have inadequate diets because of limited

*The author appreciates the helpful assistance in preparing this paper from members of the Economic Research Service, the Foreign Agricultural Service, and the World Board.

food supplies and high prices which most potential buyers living in abject poverty cannot afford.

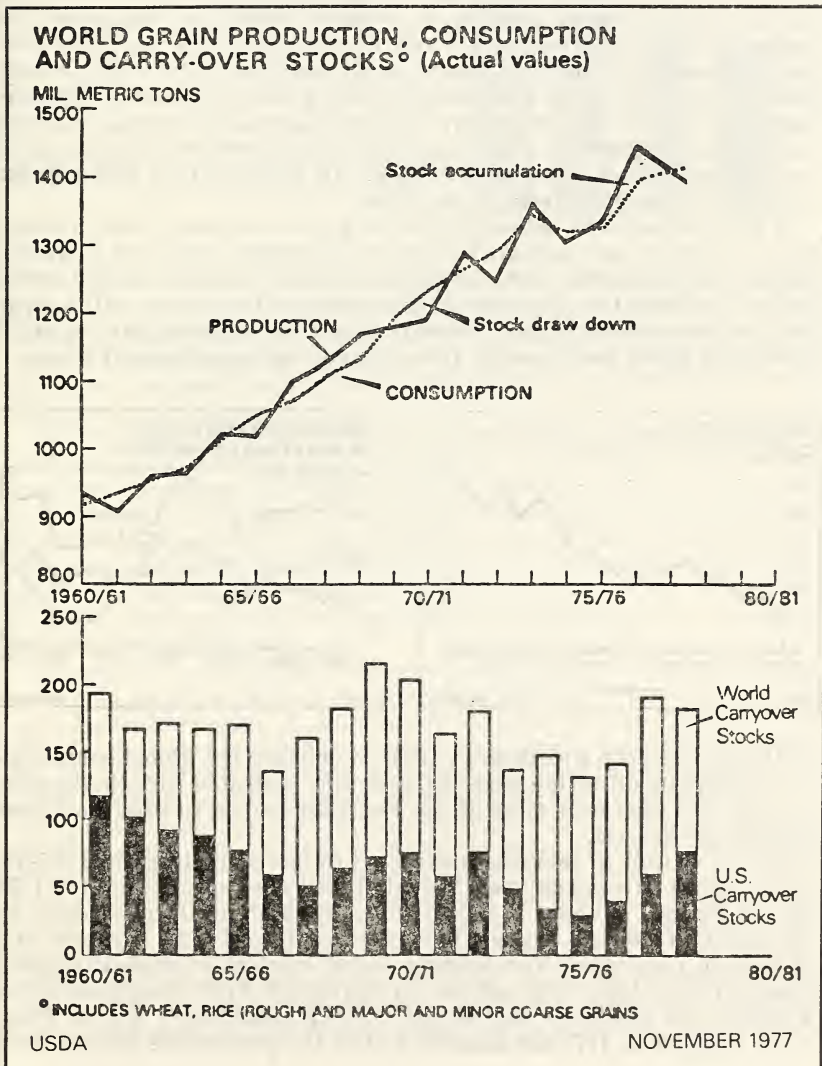
Some of the major issues bearing on the agricultural outlook and prospective returns for U.S. farmers and for farmers in most food exporting nations center around the access to and prosperity in foreign markets. Among the developed nations, which include the major exporters as well as major markets for food, trade barriers, and domestic policies affecting trade, prices, and returns to producers effectively limit the flow of world trade in grains, soybean meal, meats, and dairy products. As a result, high and relatively stable prices in some major markets are unable to adjust to changing world supply/demand conditions usually brought on by unpredictable fluctuations in world weather and growing conditions. Since supply variations usually bring sudden and sharp changes in prices and stocks, those markets which remain open in the world must absorb the wide price instability aggravated by the unresponsiveness of some large markets which are essentially insulated by domestic price policies and barriers to trade. Because of this whiplash effect, mainly on the open markets, although other world markets are affected as well, many nations are examining domestic and trade policies designed to counter these effects. Accordingly, there is interest in reducing barriers to trade, development of trade agreements, accumulation of international food reserves, and domestic farm programs that will help to iron out the peaks and valleys in price fluctuations, improve world food security, and at the same time strengthen returns to farmers.

Equally complex, and perhaps less understood, are efforts to expand economic activity and food production in the developing countries. Both internal programs and external aid financial development activities need to be carefully coordinated with policies in the developed nations in order to generally improve nutrition levels and provide more stability in food and agricultural markets.

THE WORLD PICTURE

First a look at the demand side for the coming year. Worldwide economic activity has slowed in recent months. However growth is projected to average in the 4 to 4½ percent zone for the developed nations. Weakness is also expected in some developing nations in the latter half of 1978. Although a continued moderate rate of investment in plant and equipment is expected into 1978 in the United States, prospective growth in domestic markets in other countries appears to be short of that needed to generate incentives for increased investment spending in early 1978. The combination of sluggish capital investment, low levels of industrial activity, and rising costs and prices have continued to keep unemployment at high levels as well as constrain growth in consumer demand in many developed countries. Moreover, increases in world trade could slow in 1978, barring some stimulus, to a rate of perhaps 5 or 6 percent compared with an increase this year of 8.5 percent. However, programs to stimulate activity in developed nations may lead to increases in consumer demand and capital investment as well as increase the risks of accelerating inflation. Thus, fear of inflation remains a key impediment to expansionary policies.

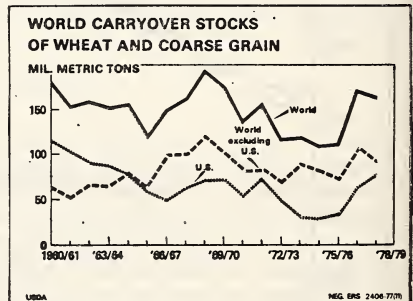
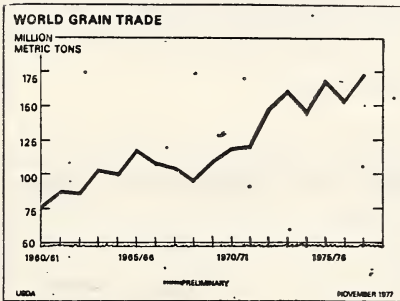
Following last year's record world grain crops and an enormous buildup in stocks, it now appears that global production of wheat and coarse grains in 1977 will likely total some 3 or 4 percent below the 1.1 billion tons estimated for last year. The decline stems mainly from an estimated drop of more than 30 million tons in the U.S.S.R. Smaller declines are indicated for Canada, Australia, Argentina, Thailand, and Brazil. Most of the indicated decline is due to a cut of about $7\frac{1}{2}$ percent in wheat production although the coarse grain crop also is expected to drop around 2 percent below the 1976 crop. However, it is still early in the season, especially for Southern Hemisphere crops, and these estimates should be interpreted with a considerable band of uncertainty about them.



Food use of grains may increase only modestly—around 1 percent—but with big supplies of feed grains as well as relatively low prices and growing livestock output in many developed countries, world feed use will increase. The biggest increase is indicated for North America where feed grain supplies are large. Gains are also expected in areas such as Europe and Japan where grain prices play a less important role in allocating grain supplies.

With modest gains in utilization, global carryover stocks of wheat and coarse grain are now indicated some 4 to 6 million tons below the relatively large 169 million ton carry-in. A small increase is indicated for coarse grain stocks, but it now appears the wheat carryover may run 10 to 15 million tons below the estimated carry-in stocks of 97 million metric tons. Unlike the rest of the world, stocks will continue to buildup in the United States, possibly by around 15 million tons mostly in coarse grains. But stocks in the rest of the world will be smaller perhaps by around 20 to 25 million tons. By the close of the 1977-78 marketing year, U.S. grain (wheat and coarse grain) stocks may approximate 75 million tons or nearly half of the world's carryover. Such stocks would represent about 7 percent of projected world grain utilization, the highest ratio since 1971-72. In 1974-75, U.S. grain stocks were only about 2.7 percent of world use.

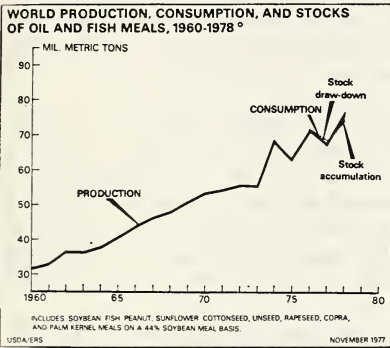
Trade estimates for wheat and coarse grain have been lifted in recent days reflecting the indicated drop in the Soviet crop and increased import requirements. U.S. farmers who have the bulk of the world grain available for shipping at this point in the season will supply much of the expected gain in world trade. The estimated gain in world trade will likely come mainly from stepped up movements of wheat.



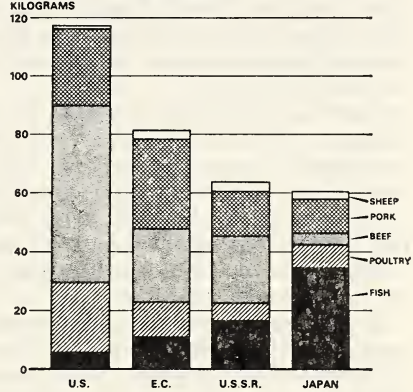
World rice crop prospects in 1977-78 enhance the global grain supply picture by offsetting part of the decline indicated for other grains. A good monsoon over most of the Far East helped to produce a near record rice harvest.

World output of oilseeds is expected to be record large in 1977-78, up 12 percent from last year. World oilseed meal production for 1978 is now forecast at about 78 million tons (soybean meal equivalent), up 17 percent from last season. The expected record U.S. soybean crop is largely responsible (accounting for 43 percent of global output). Gains are also likely for soybeans in Brazil and Argentina, rapeseed in Canada, and sunflower seed in the U.S.S.R. and South Africa. Fish-meal supplies in 1978 are uncertain after the precipitous decline indi-

cated for 1977. Demand for protein meals is expected to rise in both Western Europe and Japan as feeding of hogs and poultry continues to grow. The U.S.S.R. is projected to take about 1 million tons of U.S. soybeans.



1976 PER CAPITA MEAT CONSUMPTION IN KILOGRAMS CARCASS BASIS



Forecasts of world oil production (vegetable, animal, and marine oils and fats) indicate an output of about 53 million tons, 5 million tons above 1976's reduced volume and about 3.5 million above the 1976 record. Production gains are indicated for soybeans, palm, cottonseed, sunflower, rapeseed, and olive oil. the United States will account for about one-third of the increase.

World meat production is projected to increase only moderately in 1977 compared with the sharp increases in recent years. Meat production (red meat and poultry) in the key commercial markets of the world—the United States, Canada, EC, and Japan—is estimated at 46.4 million tons for 1977, up about 1 percent from 1976. Output of red meats in these commercial markets is expected to increase fractionally, while poultry output is projected to increase by 3 percent. For the red meats, a further decline in beef and veal supplies will be more than offset by gains for pork.

The major uncertainty relating to next year's red meat production centers around the cattle cycle. If herd liquidation in the United States and Australia begins to bottom out by mid- to late-1978, the turnaround and some withholding of breeding stock will bring a further decline in beef and veal output in 1978. However, such a decline will likely be offset by increases in production of pork and poultry.

Turning to the current world dairy situation, the surplus continues. Milk production for 1977 in 36 major producing countries will set another record at 395 million metric tons, up 2 percent from 1976. A 1-percent rise in fluid milk consumption was not large enough to absorb the increase in production. This has led to a shift of more milk into manufacturing uses. Cheese and butter production are running much larger, while nonfat dry milk (NFDM) output is expected to hold steady. World consumption of cheese continues to grow more rapidly than butter and NFDM. Hence, global butter stocks by the end of the

year are expected to be up 24 percent. While stocks of some manufactured dairy products are expected to decline, stocks of both butter and NFDM are becoming burdensome in most major producing countries.

World sugar stocks have increased greatly as the result of a record sugar crop in 1976-77 that substantially outpaced consumption. Prospects for another record crop are indicated for 1977-78, with production increases in Brazil, Cuba, France, and the U.S.S.R. The Philippines and the United States reduced planted area as well as the output. Thus, the near-term outlook is for world raw sugar prices to remain at relatively low levels, although prices could strengthen over the long term.

The U.N. Sugar Conference, in which the United States was a participant, adopted on October 7 on an ad referendum basis, a new International Sugar Agreement which will rely on a combination of export quotas and stock accumulation and release of stocks to defend a price range of 11 to 21 cents per pound. The agreement, which is planned to go into force provisionally on January 1, 1978, aims at holding intervention to a minimum when prices are around the middle of the agreed price range.

Current prospects for an increase in world coffee supplies in 1977-78, coupled with a decline in net import demand, should lead to some further decline in coffee prices. Present prices for green coffee of \$1.65 to \$1.80 a pound, New York, compare with record highs in excess of \$3.30 in April. Under the new International Coffee Agreement of 1976, of which the United States is a member, export quotas are the main instrument for stabilizing prices when supplies are in surplus. World prices are likely to remain above export quota trigger levels for at least another year or more, unless the ICO Council revises present price provisions of the agreement.

A modest rise in world demand for cotton in 1977-78 is not expected to offset a 10-percent increase in world cotton output of 63.7 million bales (480 pounds), so that world stocks should rebuild following 2 successive years of large drawdowns. Cotton acreage may be up about 6 percent, reflecting the response to strong prices early in 1977 by Northern Hemisphere producers; Southern Hemisphere producers may not increase acreage because prices had declined by their later planting time. Cotton prices have become more competitive with manmade fiber prices, which could stimulate cotton consumption in the textile market which continued depressed in early 1977-78.

U.S. SCENE

We have been discussing the world food and agricultural outlook. Now let's look at matters at home. The U.S. agricultural plant is huge. This Nation accounts for about a fifth of the globe's food production. We produce a seventh of all the wheat, a fifth of the cotton, a fourth of the feedgrains and well over 40 percent of the soybeans. Keep in mind that only 5 percent of the world's population resides in the United States.

When we look at world trade we see that U.S. exports dominate many world markets. U.S. wheat exports this year will account for about 40 percent of the world wheat trade. U.S. feedgrain exports will

run about 60 percent of the total, while U.S. soybean exports capture about half of world exports. The U.S. share of the world's cotton trade is about 25 percent.

The world food and agriculture picture has changed during the past couple of years—crop production has been large and there has been a substantial rebuilding of stocks. This, too, has been the U.S. pattern. Farm output this season is up more than 3 percent from last year and over a 10th from 1974. Output gains reflect expanded acreage, higher yields and an upswing in slaughter of meat animals, dairy products, and poultry and eggs. If weather patterns are favorable U.S. farm output will continue large in 1978. Production of livestock products will likely remain large as relatively low feed costs help encourage expanded production of fed beef, pork, poultry, and milk. Crop output in 1978, however, is difficult to forecast at this early stage. Weather, of course, is always a dominant feature in the crop picture. Price expectations and relationships among crops as well as Government programs are also important. Subsoil moisture has been plentiful in the Midwest this fall and unless weather patterns turn unfavorable, crop output should continue large in 1978.

Expanded farm output this year has brought depressed farm prices. Prices received by farmers will run about 4 or 5 percent lower. Depressed crop prices account for most of this decline. Next year, if export markets hold up, even with continued large crop output and some gain in livestock production, farm prices should hold near 1977 levels—expected lower average crop prices may be nearly offset by higher prices for livestock and products.

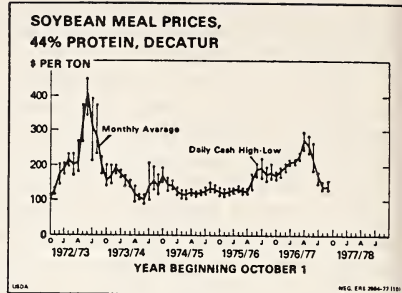
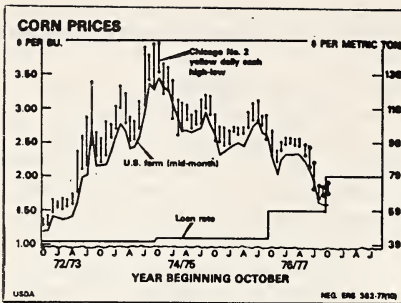
Let's look at some of the major commodity developments for 1978: Crop production is indicated record large in 1977. Timely rains this summer in the Corn Belt offset poor subsoil moisture conditions during the early growing season. However, field crops were hard hit by drought in the Southeast. But even though yields were mediocre in some areas, large crops are indicated for grains, oilseeds, and cotton.

The feed grain crop is a record in 1977—201 million metric tons, or 5 percent above 1976. The corn crop is breaking a record for the third year in a row. Although domestic use and exports of feed grains have been relatively large in recent years, production has gone up faster and stocks have mounted, especially the past two seasons.

Wheat acreage in 1978 may drop about 15 percent because of the 20-percent set-aside on 1978 crop wheat. The smaller cut in acreage reflects the fact that some growers will not participate in the program. But in view of the good moisture conditions and barring unfavorable weather developments, the crop next year probably will be down considerably less than the reduction in acreage—perhaps around half the set-aside acreage reduction.

Deficiency payments to wheat growers will become an ever more important factor in 1978. They will be based on a percentage of 1978 plantings for harvest and the farm program yield.

Hefty crops and big carryovers from 1976-77 pushed grain prices down early in the season. However, recent indications of stronger export markets mainly from expected U.S.S.R. buying coupled with higher 1977 loan rates and increased loan activity have given some modest support to prices. The grain reserve program could lend some further strength as the season progresses.



Attractive grain and protein meal prices are encouraging livestock and poultry producers to step up output. Producers are moving cattle into feedlots, farrowing more sows, placing more broiler chicks and layers, and feeding more concentrates to dairy cows.

Pork production was up sharply in the first half of 1977, but the severe winter and disease problems limited second half output. Production gains are likely to accelerate next year by as much as a 10th due to better feeding margins.

Cattle placed on feed in 23 States were up 14 percent this summer. Placements should continue large in 1978 boosting fed beef production. However, a cutback in slaughter of nonfed cattle will keep total beef output under a year ago throughout 1978.

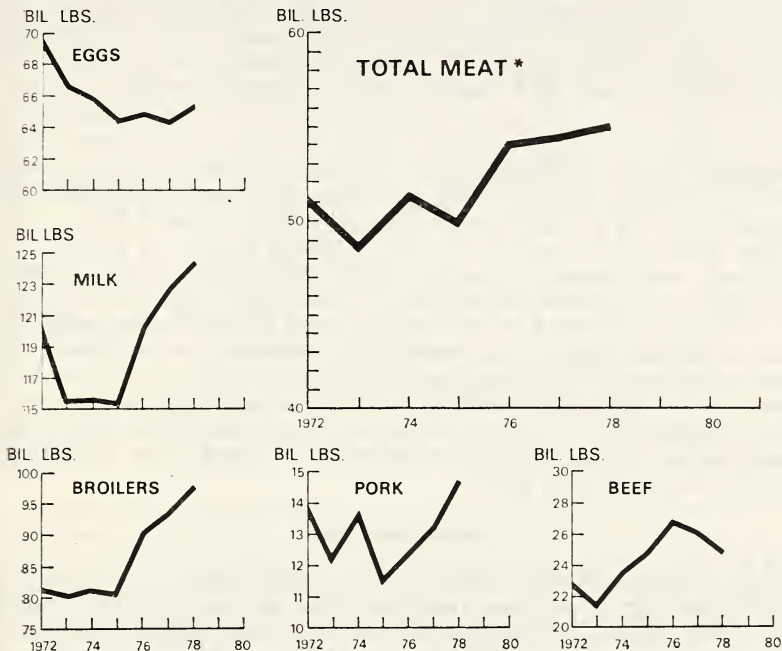
Broiler chick placements indicate 3 to 5 percent larger marketings this fall; continue expansion is likely in 1978—running perhaps 5 percent above 1977. Production of milk and eggs is also expected to total above a year ago through mid-1978—milk by 2 to 3 percent and eggs by 1 to 2 percent.

Despite pressure from large supplies, overall livestock prices this fall are likely to run 5 to 10 percent above the depressed October–December 1976 level. Prices of hogs will decline from summer levels with large output, continue above last fall. Broiler and egg prices have strengthened some but large supplies in coming months will keep prices below last fall. Fed cattle price may average in the low forties this winter before rising seasonally next spring. Further price rises are expected in late 1978.

Milk prices may run moderately above a year ago in first half 1978 because of higher supports. With increasing output, more milk has been moving into manufactured products. As a result, USDA purchases of dairy products under the price support program have increased substantially and Government-held stocks are building.

Volume of the 7 major processing vegetables this year is up 18 percent, with the biggest gains in tomatoes and sweet corn. Wholesale prices for canned vegetables rose steadily in the spring and summer. With heavier new crop supplies, canned vegetable prices may run about the same or only a little higher than a year earlier well into next year. Supplies are tighter for frozen products. Stocks of frozen vegetables are 1 percent smaller than a year earlier. Wholesale frozen vegetables' prices moved up during the summer, and prices will remain well above a year earlier.

PRODUCTION OF LIVESTOCK AND LIVESTOCK PRODUCTS

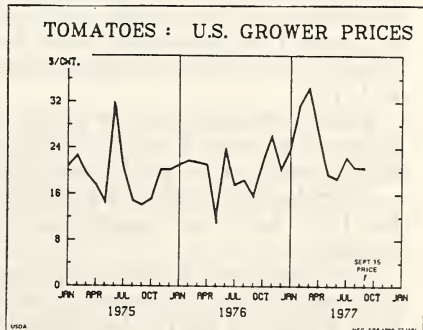
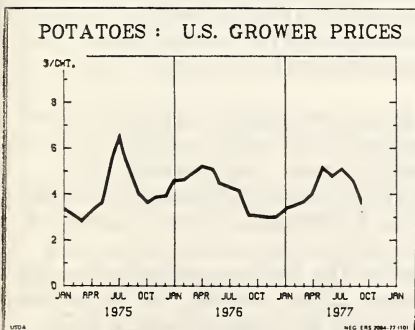


* INCLUDES BEEF, VEAL, LAMB AND MUTTON, PORK, POULTRY MEAT.

USDA/ERS

NOVEMBER 1977

With another large crop of fall potatoes in prospect—only 1 percent below the 1976 record—grower prices will remain low and close to the year earlier average. With export demand slackening, and only moderate processing activity, markets lack the brisk pace of last year.



The first citrus crop forecast of the 1977-78 season was down 6 percent from last year's record and 2 percent below 1975-76. The orange crop will be down 9 percent, but Florida's early and midseason crops—big juice producers—will be down 23 percent. While juice yields will be up, and a larger pack is in prospect, low carrying stocks will pull down total supplies. This together with strong demand will keep frozen concentrated orange juice prices at high levels.

The 1977-78 pack of most processed noncitrus fruit is expected to be up. However, supplies are still likely to be near last year's level because of smaller carry-in stocks. Supplies of dried and frozen fruit could be slightly above a year ago. Demand is likely to be good here and abroad with prices of most items expected to remain firm.

The outlook for the 1977-78 cotton season features a larger U.S. carryover next summer. Disappearance may change little as larger U.S. mill use may about offset smaller prospective exports. The quantity of cotton produced in this country next year will depend on the price of cotton relative to competitive crops such as soybeans and grain, sorghum, plus weather and program provisions. Prices for both cotton and competing crops have declined in recent past months with cotton experiencing the sharpest drop. Current price relationships between cotton and competing crops would indicate 10 to 20 percent fewer acres of cotton in 1978.

FARM INCOME

Farm income prospects deteriorated sharply this past summer as rapidly falling crop prices took their toll on cash receipts. While prices have generally strengthened recently from their harvest lows, crop receipts from marketings in all of 1977 could be the lowest since 1973. However, higher CCC loan rates under the new legislation are expected to produce greater use of the loan programs and limit further price declines. Total crop receipts for 1977 are expected to total near the 1976 level of over \$47 billion. Receipts from net loan activity could run as much as \$4 to \$5 billion above last year's \$1 billion.

Lower feed costs are having their effect on the livestock sector. Feeder animal prices are being bid up, placements of cattle on feed are increasing, and farrowing intentions are up sharply. Recent drops in feed prices have given rise to the most favorable feeding margins in years. The impacts of these developments will be reflected in both livestock producers' incomes and retail food prices later this year and in 1978.

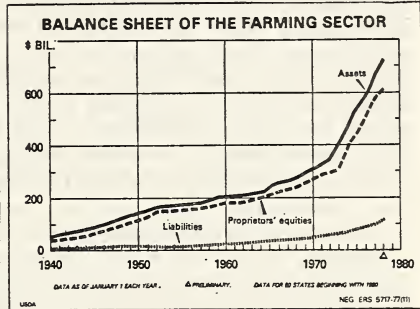
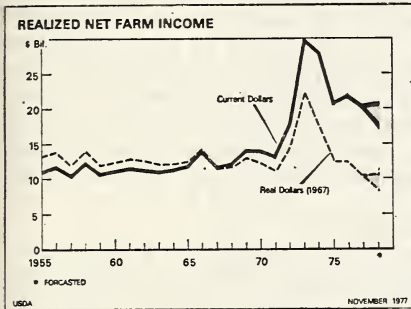
For the current year we expect only moderate gains in livestock and livestock product receipts. With prospective volume up slightly, overall livestock prices will probably average near last year's levels.

Overall cash receipts for 1977 should total roughly near \$94 billion for 1976, with the changes in crop and livestock receipts about offsetting.

The new farm program will improve the income outlook through increased direct Government payments. These should rise from less than \$1 billion for the last several years to about \$2 billion in 1977.

Beyond increasing deficiency payments in 1977, the new legislation is boosting this year's cash incomes through higher loans and supports to sugar growers.

Taking these factors into consideration, total realized gross income for 1977 is expected to be up from last year. The overall increase in production expenses this year has moderated due to smaller increases in costs of production items (especially feed), interest, taxes, and wages. With only modest increases in production expenses, net farm income should remain near the \$20 billion level in 1977. However, in constant dollars this could be the lowest level of net incomes since the early thirties.



But net farm income doesn't tell the whole story. There are at least two other key factors to consider when attempting to measure the economic well-being of farmers. One is that many farmers earn a considerable portion of their income from nonfarm sources. Historically, the total farm population—when small farms are included—has been earning about as much from nonfarm sources as from their farming operations. In 1977, income from nonfarm sources accounted for 55 to 60 percent of the average income of farm families. Of course, the smallest producers tend to earn the largest share of their incomes off the farm.

Income alone does not tell the whole story of the status of U.S. agriculture. One needs to also consider the farming sector's capital position has to be analyzed—its asset and debt structure. Here we find that, although farmers' current income positions may be under stress temporarily, many farmowners are well off in terms of net worth. By the end of 1977, the value of farm assets is expected to total \$730 billion, a gain of \$59 billion for the year. The farm debt is forecast to total \$119 billion, leaving a net worth of \$611 billion, an increase of \$43 billion for the year.

As usual, the big mover in farm assets is real estate. Its value is expected to total \$547 billion this year, and account for three-fourths the value of all farm assets. Despite heavy pressure on farm prices this year, farmland values are still rising, although reportedly at reduced rates and even declining in scattered areas.

The value of other farm assets advanced in 1977. By January 1, 1978, the value of livestock on farms will be about 7 percent larger than 1 year ago due mostly to improvements in cattle prices. Machinery and motor vehicle values will be up about 4 percent, mainly reflecting higher unit values. The buildup in grain stocks will also help push the asset values up despite lower prices for some commodities.

Farmers' financial assets are expected to post a modest gain of about 5 percent in 1977, but most of the increase will be in rather nonliquid investments.

The farm debt is estimated to increase about 15 percent in 1977. A sharper than usual rise in farm real estate debt will be due in large part to more borrowers turning to refinancing burdensome short-term indebtedness into longer term real estate secured loans.

Attempting to estimate farm income levels for 1978 is extremely hazardous at this early stage. Although crop prices should increase seasonally in the first half of 1978, large carryover stocks will be limiting factors. More importantly, prospects for the 1978 crops will dominate income flows to producers in the second half of 1978. The new farm program will have an even greater impact on incomes to producers in 1978. In addition to the likelihood of large deficiency payments to wheat producers, there will probably also be payments to feed-grain producers in the coming year. In addition, the net income of livestock producers should improve as the new year unfolds. However, production expenses will continue to rise and likely offset any improvement in current dollar net incomes.

Despite lower net farm incomes this year, traditional lenders were willing to finance all but a few farm customers. Although some banks in scattered localities—primarily in cattle and wheat areas—were hard pressed to come up with sufficient loan funds, in most cases farm borrowers were well served. The average farm debt-to-asset ratio while rising in 1977 is still 16 percent and has changed little since the mid-sixties. Experienced lenders are aware of farmers' equity position. Current indications are that lending institutions intend to continue serving the farm sector, even though the price-cost problems exist.

FOOD AND MARKETING

Despite record large farm output and generally lower prices to U.S. farmers, food prices in grocery stores for all of 1977 will average about 6 percent higher. Higher prices for fish and imported foods, especially coffee, account for about three-fifths of this increase. The remainder is due to higher costs of processing, marketing, and distributing food. Prices for restaurant meals and snacks, which are influenced even more heavily by cost increases after food leaves the farm and which also reflect higher coffee prices, will average nearly 8 percent above last year.

Current conditions suggest large crop harvests this fall along with an anticipated expansion of livestock feeding will hold the average prices of U.S. farm-produced foods about steady through mid-1978. If coffee prices continue to decline as expected, offsetting further increases for other imported foods and fish, average prices for these foods will also show little change. Consequently, relatively moderate increases in retail food prices, in the neighborhood of 1 percent or so each quarter, now appear likely through the first half of 1978. These expected increases primarily reflect continued upward pressure from processing and marketing costs.

PROCESSING AND MARKETING COSTS TAKE THE BIGGEST BITE OUT OF CONSUMER FOOD BUDGETS

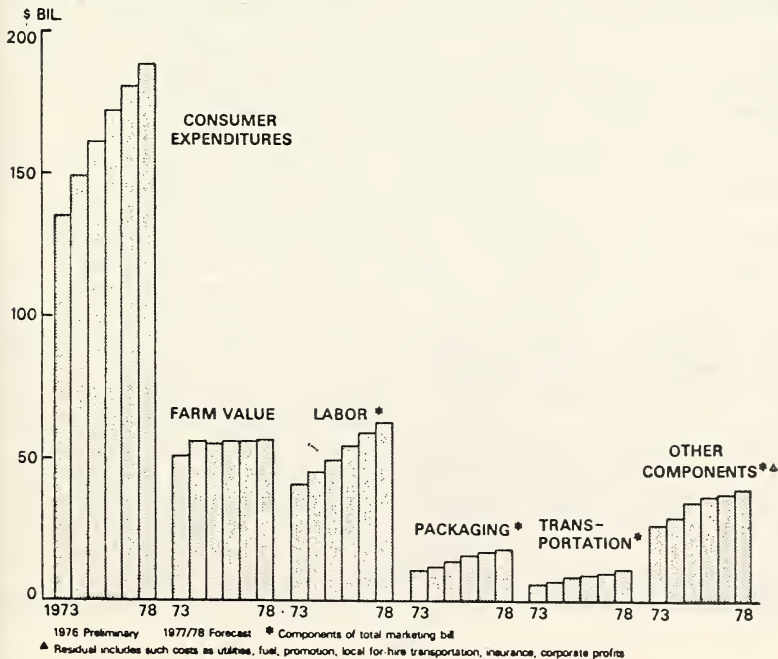
Inflationary pressures from rising wages of food processing and marketing employees and costs of various inputs used by food processing and marketing firms, are expected to continue their upward push on retail prices. Recent and prospective wage agreements in food and allied industries, and the pending increase in the minimum wage, will accelerate labor costs in the food industry. In addition, higher prices for other goods and services, such as energy, packaging materials, and transportation, can also be expected to contribute to higher retail prices.

In 1978, it appears that processing and marketing costs could average 4 to 6 percent higher for the year. Increases will vary among products, with cost pressures greater for highly manufactured foods than for more perishable products such as meats, fresh fruits, and vegetables which are more responsible to change in farm gate prices.

LABOR NOW LARGEST COMPONENT OF CONSUMER FOOD EXPENDITURES

Consumers will likely spend around \$180 billion for U.S. farm foods this year, up from around \$136 billion in 1973. Nearly 90 percent of this rise will result from increased marketing costs. As a matter of fact, since 1974, the farm value of these farm-produced foods has held fairly steady, while processing and marketing continue to push upward. Over 40 percent of the rise in food expenditures since 1973 has been due to increased labor costs.

U.S. FARM FOODS



In 1977, labor costs involved in processing and marketing food will probably become the largest single component of consumer food expenditures, taking almost a third of the consumer's food dollar. Look for labor costs to exceed the value farmers receive for producing for the first time. Labor costs could top \$58 billion this year, while the farm value may hold at about \$56 billion.

1977 FOOD CONSUMPTION SLIGHTLY BELOW 1976 RECORD

Per capita food use, which hit a record in 1976, may be down slightly this year—perhaps about one-half percent—but still the second highest in history. The modest drop will be largely due to a slight decline in crop foods. Per capita use of livestock foods likely will hold about steady with last year's record.

Among the crop foods, consumption will be down for coffee, fruits, and fresh vegetables. These declines reflect short supplies and higher prices earlier this year. Consumption of most other crop foods will hold about even with last year.

Consumption of livestock foods reflects larger supplies of pork and poultry, which will about offset lower consumption of beef, fish, and eggs. Per capita use of dairy products likely will be about the same as last year.

U.S. AGRICULTURAL TRADE

(By Thomas R. Saylor, Associate Administrator, Foreign Agricultural Service
USDA)

Your earlier speakers, in discussing the substantial world grain crop and economic growth prospects, provided the setting for what I have to say about the outlook for U.S. agricultural trade.

Let me begin by saying that there probably are more uncertainties involved in trade forecasting at this time than ever before—and that is saying quite a lot, given the nature of trade in the seventies.

In such a context, the capabilities of the Foreign Agricultural Service to provide timely and adequate forecasting become even more important.

While I am new to the Foreign Agricultural Service myself, I have in another capacity, observed the reporting and analysis which has been coming out of that agency for several years. Frequently in the face of strong rumor and public opinion, we are pressed to adjust our forecast. I am pleased that despite significant pressures, our analysis stood firm in their positions on the soybean and coffee markets earlier this year. FAS has maintained and will continue to maintain a policy of basing forecast on solid analyses. We will attempt to build upon our existing base of resources to strengthen our forecasting capability.

We hope to develop new tools such as LACIE, which can supplement those resources, and we will seek to make better use of existing tools such as our network of attachés, bilateral information exchanges, and, wherever needed, seeking to have specialists visit foreign producing areas to make assessments on the ground during critical periods of the crop season. Only in such a way can we establish and maintain a sense of trust in our analytical and reporting services.

Within the uncertainties I mentioned, the Department of Agriculture is predicting an increase of close to 10 percent in the volume of agricultural exports in fiscal year 1978 to just short of 110 million metric tons. That would be a new record, and that is the good news. Unfortunately, export prices averaging around 15 percent below those of last year will more than offset the volume increase, so we look for a 1978 export value of about \$22 billion—\$2 billion below the record \$24 billion of fiscal 1977.

That was the bad news, but I think the growing world demand for food and the growing interdependence among countries cited by Dawson Ahalt can make bad export news a short-term proposition if we take advantage of what we have learned during the years of unprecedented agricultural export growth.

I want to talk about that later, but first I should summarize the prospects for the current fiscal year. As I said, we expect exports of

\$22 billion. At the same time, U.S. agricultural imports are forecast to total about \$13.5 billion, marginally above the record imports of last year. What it adds up to is the prospect of a decline in the U.S. agricultural trade surplus of about \$2 billion from last year's \$10.5 billion.

Grain exports and those of soybeans are expected to increase in volume by about 10 percent. Cotton exports look to be down somewhat in both volume and value, along with shipments of animal fats and vegetable oils.

Among the major markets, we expect U.S. exports to Western Europe to decline, perhaps by as much as 15 percent. Good harvests there will result in reduced imports of U.S. feed grains and potatoes. However, a higher grain/oilseed price ratio should stimulate increased shipments of soybeans and meal to this region, and harvest damage to European wheat quality should bring slightly larger imports of U.S. high-quality wheat.

Although we expect increases in volume of both feed grains and soybeans and meal to Japan, lower prices for these commodities are expected to cause a decline in value of our exports to Japan of close to 15 percent. Wheat exports to Japan may increase marginally, and increases are forecast for fruits and animal products.

U.S. agricultural exports to Canada, North Africa, and West Asia are expected to rise, and a sharp gain is forecast in exports to the Soviet Union—from \$1.1 billion in fiscal 1977 to \$1.6 billion in the current year. U.S. exports to Eastern Europe are expected to rise by about \$120 million to \$1.1 billion.

I should also mention the People's Republic of China (PRC), where this fiscal year will see the first significant U.S. farm exports since 1975. The PRC already has bought U.S. cotton and soybean oil for delivery during the year and some added purchases of U.S. products seem likely.

U.S. agricultural exports to East and Southeast Asia are expected to continue their strong growth of recent years. Volume increases are expected in wheat, feed grains, soybeans, tobacco and cotton, although total value probably will be little different from the \$2.47 billion of last year.

The outlook for the major commodities: The U.S. grain and feeds export forecast for the year is \$9.8 billion, off 4 percent from last year. This includes prospects for substantially higher imports by the U.S.S.R. However, to reach the projected level of imports which is currently estimated at 20–25 million tons from all sources, a substantial pickup in the rate of actual shipments to the U.S.S.R. will be required in the coming months. West European coarse grain imports from all sources will likely decline from last year's level, although the extent of livestock feeding could moderate the expected decline.

Right now, we are forecasting feed grain exports of 50.4 million tons valued at \$4.8 billion. That would be near last year's volume but down somewhat in value. It looks like wheat exports will rise by about 20 percent in volume. This will be enough to offset the lower price and bring the value of wheat and flour exports to \$3.1 billion, slightly more than last year.

We look for a decline of 22 percent in export value of oil seeds and products to \$5 billion, despite a significant increase in export volume of soybeans and meal.

Livestock and livestock products exports, which last year hit a new record and exceeded imports of these products for the first time, will decline slightly this year to about \$2 billion. Within this category, we expect beef exports to increase and pork exports to decline. There should be a slight rise in poultry exports, and dairy products shipments may rise slightly.

Some decline is anticipated for cotton and for tobacco, both in volume and value, while exports of fruits and vegetables are expected to continue to rise, thanks in large part to poor fruit crops in Europe.

What it all adds up to is that for the first time in 8 years, U.S. agricultural exports are not expected to show a value increase.

Despite the prospect of a slight decline, we still are expecting U.S. agricultural exports of more than \$20 billion for the 5th straight year. And to put this figure into a longer term perspective I should remind you that this is a level over three times greater than the average of the sixties.

Most of us are familiar with the history of that dramatic growth: Rising world income, crop shortfalls, devaluation, and other factors that triggered an upsurge in export demand to which U.S. farmers responded quickly.

There is more to the story, however—an aspect we tend to overlook. It is that the sharp growth in the seventies came from a solid foreign-marketing base laid in the fifties. There was market development work, begun in the fifties; there was a shift toward export marketing in U.S. farm program pricing policies; there were major trade negotiations, including the achievement of a zero-duty binding on soybeans to the European Community, and there was the growth of U.S. agriculture's reputation as a dependable supplier.

Those elements remain largely intact as we stand on what appears to be a plateau in export growth. The question as we move into the final 2 years of the hectic seventies is how best to use these resources to build for new growth under new conditions.

Things have changed in international agricultural trade since the sixties. Competition has increased, particularly in oilseeds. The European Community continues as our traditional and most important market, but its relative importance has declined as other markets have emerged. While U.S. agricultural exports to the Community were going up by 2.7 times from 1970-72 to 1976, to \$6.4 billion, exports to the rest of the world went up even faster—by 3.3 times, to \$15.8 billion.

Japan, for example, crossed the \$1 billion mark as a U.S. agricultural customer in 1970, and last year bought more than \$3.5 billion worth as our most important single country market. West Germany and the Netherlands, traditionally near the top, were second and third last year, but the fourth largest market was the Soviet Union, an indication of the increasing role played by the centrally planned economies in U.S. agricultural export trade.

Between 1970 and 1976 the share of U.S. agricultural trade represented by these nations grew from 2.5 to 10.5 percent, on a value basis.

The value of U.S. exports to the developing countries has grown by about three times since 1970, but the most significant thing about these shipments is the change in the mix from concessional to commercial sales.

Export commodity components also have been changing. Growth has been most rapid for feed grains and soybeans—products that support the production of livestock products. There have been notable gains in fresh fruits and other higher cost food items. But the center of this growth has been shifting from Western Europe to Japan, and, for feed grains, to the U.S.S.R., Eastern Europe, and, to some extent, to the higher income developing countries such as South Korea and the Republic of China on Taiwan.

Wheat trade patterns also are changing. Wheat trade to the developed countries has grown little in the seventies, but the demand for wheat in the developing world is growing. Since 1974, more than one-half of world wheat imports have been by developing countries, and recent studies project their food grain import needs to be possibly double the 30 to 45 million tons of 1970–75 by 1985.

The People's Republic of China also appears to be emerging as a regular buyer of large amounts of wheat. You will recall that we sold the Chinese 5.1 million tons of wheat in 1972–74. Then they quit buying from us, but not from others. It is expected that they will import at least 9 million metric tons this year—from Canada, Australia, and Argentina.

What all this suggests to me is that U.S. export strategies for the future must be based on where we can sell a commodity as well as how we can sell it. It suggests that economic development programs in poorer countries can be as important as sales promotion campaigns among the prosperous, that credit facilities and most favored nation treatment can be as potent as the shrewdest trade negotiator in laying the base for solid, sustained growth in U.S. agricultural exports.

It suggests a total approach to U.S. market development that takes account of the three distinct markets that have emerged during the hectic period of the seventies. There are the developing countries, in which poverty keeps the lid on effective demand from a huge and rising reservoir of food needs. Then there are the centrally planned economies, where States have decreed more meat, milk and eggs for the people, but foreign exchange and weather are the keys to how fast and how far the increases will go. Finally, there are the developing countries, where import barriers imposed largely to support domestic agricultural programs serve to restrain the demand for higher priced foods resulting from the economic growth of the sixties and the early seventies.

The task of export expansion is to put together an approach adapted to each of these markets and to do so with the objective of tapping the demonstrated long-term potential in each.

Perhaps it seemed appropriate for the times, but I think the United States in the past has focused too hard on immediate problems in agricultural trade—the ad hoc “quick fixes” that spawned embargoes, trade wars, and other aberrations from which nobody gained. In this regard, the problems of steel, shoes, and TV sets are, in part, the problems of American agriculture, for the means by which the problems are resolved have profound implications for our own ability to keep export channels open and to seek expanded markets.

However, our focus should be on the very evident future growth of world demand for agricultural products and on insuring our share of that growth.

I do not think it is an overstatement to suggest that we have reached a watershed in U.S. trade policy. The sluggish world economy as well as long-term structured developments in that economy have given rise to a new pattern of protectionism. And in such a context, we must be cautious that the policies we take do not contribute to the weakening of the GATT framework within which world trade has expanded over the past several decades.

It is easy to find actions on the part of other countries to expand their trade position in contravention of established trade rules. We must resist the tendency to emulate such actions both for the interest of our own economy and the expansion of world trade. Otherwise we may contribute to a snowballing effect where the structure, imperfect as it may be, for the orderly expansion of trade is replaced by efforts of nations to maximize short-term gain regardless of the long-term effects.

A good case in point is the export subsidy. Through sustained efforts, we have been able to limit its use against our own exports to third markets. But in periods of oversupply we continue to feel domestic pressures to return to such subsidies ourselves. Yet while a subsidy might provide some cosmetic relief, we have not been able to develop evidence that the subsidy can be effectively used to preserve market share over any sustained period. Rather, the only effect we can be sure of is that a subsidy will result in a loss of income on the part of all producing countries.

I think it would also be appropriate at this point to discuss the question of bilateral trade agreements. The Soviet grains agreement has been useful in regularizing our grain trade with the U.S.S.R. and in providing an avenue of communication with the Soviet Union on their import requirements. However, we should recognize that even in the area of information-sharing gains are going to be of an incremental nature. We feel that the Soviets understand that improved sharing of information is as important to them as it is to us. I believe they recognize that extremely disruptive buying patterns could lead to further restrictions on their access to our markets. But I would also hope that this agreement, which was shaped in a time of tight supply, does not become a restriction, in itself, on regular and expanded trade with the Soviet Union.

The case of the Soviet Union is somewhat exceptional. It is one of an open system selling to a closed system and a system which accounts for the major share of variability in world grain trade. I do not, however, see bilateral trade agreements and greater structuring of world trade replacing the basic principles of trade which have guided its expansion over the past 40 years.

We have entered into informal agreements with a few other countries but more structured agreements would not be in the interest of our own export trade over the longer term. To structure that pattern of world trade, in our view would not only inhibit agricultural adjustment which might be in our interest but would contribute to greater instability of world markets.

The race for supply/purchase agreements can be expected to be limited by the size of the market in an average year. That means there will be a residual market which is subject to accentuated supply and

demand pressures. We feel, therefore, that to encourage the modification of such agreements to structure trade is a risky strategy and one which would undermine the basis upon which we have enjoyed greatly expanded trade through our comparative advantage.

The Department has launched a course of action to implement this policy of stable, sustainable growth in agricultural exports through its market development programs and international negotiations.

As in the case of market development in general, trade negotiations require long-term strategies. We must look to realistic growth potential before spending negotiating chips.

The economic climate for the current round of trade negotiations is not very favorable, but the negotiations must show progress in the rationalization of trade. The alternative is an acceleration of the current tendency to try to solve short-term economic stress and chronic productivity problems with trade restraints.

We have tabled a tariff plan for industrial goods—a tariff formula that is intended to be indicative for reductions in agriculture. We have tabled our trade requests of other countries. Proposed codes on subsidies and other trading mechanisms are to be tabled December 15, and offers in response to requests are to go down January 15. Then the hard negotiating can begin.

As to our objectives in the MTN, a top priority, certainly, is to preserve our existing rights in the major markets.

And we will continue to press hard for improved access to markets. But we will do so more selectively, in the context of market potential as well as current buying power, and in terms of what is possible as well as what is desirable. Each chip shoved on the table will be weighed for its contribution to the primary objective of enhancing the long-term global opportunities for stable, sustained U.S. agricultural export growth.

As one aspect of the search for this objective, the United States is participating in discussions regarding the negotiations of an agreement to replace the current International Wheat Agreement. In October, the United States tabled a specific proposal which would provide for greater security of world food supplies, moderation of extreme price fluctuations, the expansion of international trade in wheat, and assured food aid to developing countries.

While a general consensus seems to be emerging among participating countries along the lines of the U.S. proposal, there continue to be some differences of view as to how the stabilization of wheat prices is to be achieved. The next step is a meeting of the Council itself November 29 to December 2 to review the work of the last two preparatory group meetings. It is likely that a drafting group will meet in early December to revise the Secretariat's draft. Then a special council session may be called in early January to consider that draft and decide whether to convene a negotiating conference in mid-February.

The U.S. view continues to be that an effective wheat agreement is needed to reduce the wide price swings that have disrupted world markets repeatedly since 1972.

We will not, however, accept an agreement which would require an alteration of our marketing system. We will not accept a pricing system which would make our grains less competitive in the world mar-

ket. In other words, any wheat agreement that we become a party to must permit our markets to function—so that efficient producers have an opportunity to compete in a world market not bound within rigid price limits.

The United States took an active role in negotiation of the International Sugar Agreement, to become provisionally effective January 1. We believe the agreement will contribute to long-term solution to a very troublesome world sugar instability.

World demand for agricultural products is growing, and it will continue to grow. It will grow in different ways for different commodities, and at different rates. The challenge in export expansion is to encourage the fulfillment of that demand by sustainable, stable growth in world trade, and to insure that U.S. agriculture gets its share.

We must, therefore, continue to build the strongest case we can for the expansion of, not protection against, world trade.

We must make better use of the resources, public and private, to facilitate long-term growth of markets for U.S. farm commodities, not just for short-term cosmetic stimulation of trade.

And we must maintain our faith in the strength of our traditional marketing system and the principles which have encouraged orderly world trade over the past half a century.

**FOOD—SUPPLIES, DEMAND,
AND CONSUMPTION**

NATIONAL APPROACH TO CARCINOGENS

(By David W. Huston for Hon. Barbara Hackman Franklin, Commissioner,
Consumer Product Safety Commission)

Several weeks ago at a press conference in Harrisburg, Pa., I called for White House leadership in the development and articulation of a national, coordinated effort toward control of possible cancer-causing substances, only one example being Tris, with which I am sure you are familiar. I said at that time that what is needed is open and frank discussion of the causes and control of cancer, the second leading cause of death in the United States, the subject of growing governmental attention, and a source of great concern to the public and to those in business who face decisions about the manufacture and marketability of many chemical compounds in a variety of applications.

The consternation of the American people is understandable. Is nothing safe any more? Are we victims, they ask, of overdramatization by the media? Regulatory overkill? Industrial conspiracies? Is this a necessary price we pay for living in a highly industrialized society? Or, are the dangers all too real and avoidable?

The stark reality, of course, in trying to answer these questions in any final way is that we find ourselves not knowing with certainty all the causes of cancer. And trying to find out is difficult, agonizing and can take years.

What we do know, however, is this: Advances in the basic scientific state of the art clearly indicate that nothing more surely will guarantee wrong answers in this area than neglect or complacency. In other words, we know enough to know that closer focus on carcinogenicity is not misdirected. In fact, we can expect more certainty as science becomes increasingly capable of identifying hazards where none were thought to exist before.

But Federal involvement spans many agencies—each with its own laws, priorities and budgetary limitations. What then constitutes adequate public protection? Are the answers to be found more in terms of the efforts of the individual agencies or the Federal response as a whole? Is attention to many chemical hazards required or a more detailed focus on a few?

There are other questions. Is there need for greater consistency on the ways agencies move from research results to regulation—or will this always boil down to decisions on a case-by-case basis within the parameters of each agency's laws? How do we minimize delay in the regulatory process yet assure an ethically and legally defensible basis for regulation, meaningful public participation and adequate due process? Do we scrap cost/benefit thinking altogether as some have suggested? Or do agencies have the obligation to assure that decisions do not go

beyond the point when regulation—or reluctance to act—may be self-defeating?

As a Nation, we need to better identify tests that are reliable, fast and cheap to screen substances for carcinogenicity. Some short-term testing is being used but no one in or out of Government is sure just yet how conclusive a predictor it is or should be as a basis for regulation. And, animal tests to determine carcinogenicity can take years and cost up to \$250,000 each. At the moment, each agency has or is formulating its own testing guidelines and criteria. So presumably are many companies.

One result is that as companies try to evaluate new chemicals on the theory that safety should be tested in the lab and not in the environment—they find no uniform Federal or scientific position on what tests should be conducted and how the results should be interpreted.

The latest example of the problems we face with the testing of toxic substances surfaced recently with Fyrol. The CPSC held a public meeting with consumer interests, representatives from private industry, and scientists in the testing field to discuss testing methods and results regarding the flame retardant, Fyrol FR-2, which has been used in some cases as a substitute for Tris in children's sleepwear. One consumer group advocated that garments treated with Fyrol be recalled from the marketplace based on a series of short-term tests done by several laboratories while those in the industry who manufacture Fyrol or clothing treated with the chemical claim that their tests, performed separately, and using different methods, did not indicate that a potential hazard exists. These kinds of discrepancies in testing methods and results make it difficult for regulators to know which chemicals may pose potential hazards to the public. Make no mistake, Fyrol and Tris are only two in a long list of chemicals that the Commission will be investigating in the future. And, I am certain that flame retardants will not be the only textile chemicals subjected to this kind of scrutiny.

Therefore all of us in Government, in the private sector, and the general public must get our act together in terms of how suspected mutagens or carcinogens are to be tested and regulated in the future.

Can or should differences in testing be resolved? In my opinion, agreement at least with respect to a battery of short-term tests to be run, standardizing the test methodologies and what that test results mean is crucial. Critical also is a uniform definition of "carcinogen" and the standardizing methodologies for conducting the longer term tests. Adjustments, of course, should be made from time to time to stay in tune with developing scientific knowledge. Then there's the issue of threshold levels—whether or not regulatory agencies can determine levels below which carcinogenic compounds have no adverse effects on humans. If we knew for certain what these levels are for the compounds—or even if they exist, making decisions would be easier. But again certainty does not exist, forcing regulators to act on the basis of the best information available and in keeping with the laws they administer.

Recent efforts to deal with this problem were headlined when the Food and Drug Administration proposed a ban on saccharin in accordance with their Delaney clause, which triggers an automatic ban. The laws administered by CPSC, on the other hand, do not contain a

Delaney-type provision. At our agency, regulation must follow a Commission decision that a substance presents an "unreasonable risk" of injury, illness or death. Still other agencies have a different approach.

In light of the important public policies inherent in this whole issue, the most compelling need, as I see it, is to sharpen, broaden and unify the focus on carcinogens—to pull our act together, expand the cast and shift the spotlight onto arriving at some better answers.

We need more and better scientific information, yes. We need intelligent and informed agency-by-agency action, yes. We need continued close cooperation among the agencies, yes. But we also must move beyond this.

What is needed is a strong, sustained and coordinated national commitment and a plan of action to find better ways to bring the hazards down to size.

With strong leadership and support from the White House, candid dialogue should begin with the scientific, academic and medical communities, the private sector, the public and others. Together, we need to develop a coordinated approach and strategies which balance the need for more consistency in Government policy with the need for flexibility for agencies to perform the jobs that Congress and the President intend.

If we don't move in this direction, I fear we run a great risk of uneven and unfair regulation that seriously shortchanges the public.

The point I am making should not be misunderstood. I am not attacking all forms of Government regulation. Rather, what is at issue is that we cannot blithely continue to mandate requirements if the substantial costs and other adverse side-effects they produce far outweigh the benefits.

A particularly good example of this occurred last week at the Commission. The Commission voted that it is "essential" to propose for the second time in 3 years extensive recordkeeping requirements that would affect over a million companies.

I cast the sole dissenting vote because I believe they are a classic example of regulatory overkill.

If finalized, the rules would compel over a million companies to generate consumer complaint files, establish and maintain an extensive central filing and retrieval system with records of each and every safety-related communication readily accessible and available. The records would have to be kept for 3 years; knowing violators could be subject to penalties up to \$500,000.

At first glance, some may consider this regulation harmless. But consider this: The Commission already can and does obtain this information simply by asking companies for it or if necessary, by issuing a special order, general order or even a subpoena. Beyond this, the Commission made no attempt to estimate the costs for companies in implementing the regulation—costs which, I believe, will be passed on to consumers in the form of higher prices without any corresponding gain in the safety of the products they buy and use. No exemptions for small businesses have been made in the text of the Commission's proposal. And, to make matters worse, the fact is that the Commission proposed substantially the same requirements 3 years ago, with public comment at that time being overwhelmingly negative.

As I see it, the Commission, in proposing these requirements, has ignored the repeated statements of President Carter and former President Ford that Government should move away from paperwork that smothers business people and hands consumers the bill unless there are good reasons. It thwarts the intent of Congress—in this case an intent specifically written into the language and the legislative history of the law CPSC administers. Congress told the Commission that we could “reasonably” mandate requirements only after giving “due consideration” to the costs and benefits. But most onerously, the proposal shortchanges the public in the name of consumer safety when, in reality, about all they will get is another blow to the family budget.

The two issues I have outlined for you tonight provide examples of the daily problems a regulatory agency and regulators face in interpreting the statutes that they are charged with enforcing. As I have outlined, the issues are complex and I am sure, will become even more so in the future. As a regulator and public official I look more and more to the public for their feelings and views on consumer product safety. I have recently established a new program consisting of a series of meetings with a large cross-section of the American public—home-makers, businessmen, women’s groups, farmers, and elderly, consumer advocates—to provide me with a broad and diversified range of views on the crucial issues that face me as a decisionmaker. I am hopeful that these meetings on a regular basis will help me to make the best possible decisions I can.

CONSUMER CONCERNS ABOUT ADDITIVES AND RESIDUES IN FOOD AND FIBER

(By Dr. Robert Angelotti, Administrator, Food Safety and Quality Service,
USDA)

This session on additives and residues in food and fiber is most timely because consumer concern over these substances in food is intense. This subject is particularly appropriate to this outlook conference because Secretary Bergland has repeatedly pointed out that USDA is the "People's Department" and as such the USDA represents the interests of all the people not just those of producers and processors who depend as heavily upon chemicals to produce the abundance and variety of foods we enjoy.

Since World War II, food processing practices and capabilities have changed in the United States from a system that provided mostly raw agricultural commodities for distribution and sale to consumers to a system of processed, prepackaged foods for consumers. This change reflects consumer desires but has been achieved through adoption of a technology in agriculture and food processing and packaging that is dependent upon chemicals.

This dependence upon and use of chemicals is viewed by consumers as another of the many technological changes which have made life very complicated. Many people feel they no longer can control their lives and destinies. People yearn for a simpler life with less problems or at least with problems they can solve as individuals or family units. Our society is dependent upon its machines and electronic systems and people are frustrated because they don't understand the systems and lack control over them. In addition they are constantly reminded that the systems are imperfect and the imperfections make their lives a misery.

The desire is real to go back to an earlier time when each man controlled his own life, when he grew and made the things he needed, when life was easy and free from uncontrollable influences. We will never go back because it is not in the nature of man. We will, however, go forward with a new awareness. An awareness that each forward stride must be assessed for its implications. This is where we find ourselves today and the Food Safety and Quality Service shall serve as the focal point in the USDA for this new awareness.

The Food Safety and Quality Service is primarily a public health oriented organization with heavy responsibilities for assuring the public that the foods they eat are safe, wholesome, nutritious and honestly and informatively labeled. We ask of food: Is it safe? Is it what it purports to be? Is it nutritious? Is it labeled honestly and informatively?

As the primary public health component of the Department of Agriculture we have a difficult task. We have in the United States a variety, convenience, and abundance of food that is unparalleled in the human experience. This achievement, as mentioned earlier, required the development of a highly mechanized agriculture and a highly sophisticated and automated food processing and packaging industrial complex. Both these production capabilities are dependent upon chemicals to provide the yield and variety we enjoy today. These same chemicals, however, have contributed to what appears to many to be a deteriorated quality of life.

Agricultural runoff with fertilizer, pesticide, and herbicide residues contributed significantly to the pollution of our water supplies. Antibiotics, and growth-promoting and therapeutic drugs are required to deliver the meat foods in the quantity and at the prices we enjoy and these occur as residues in edible tissues. The food processing and packaging industries depend on an array of chemicals to achieve the technical effects expected by consumers. Without chemicals we could not have the array available to us in the supermarket, but one wonders at what price has this been achieved? Is the time upon us to measure the benefits and costs of our present chemically oriented production and food processing capabilities?

Because both desirable and undesirable chemicals enter our food supply through either direct addition or through environmental contamination it is necessary that foods be monitored for their chemical content to assure that approved chemicals are used at levels and under conditions commensurate with their approval and that harmful chemicals are not present.

Our Food Safety and Quality Service is committed to a continuing safety review of chemicals purposefully added to our foods. These food additives must first pass review for safety by our sister agency, the Food and Drug Administration. However, recognition by FDA of a prior sanction, approval as generally recognized as safe (GRAS) or approval as a food additive has not and will not prevent us from exercising our independent responsibilities. For example, a few years ago we refused the meat industry permission to use sorbic acid, an approved additive, in meat salads because of concern that such a use might mask spoilage due to food poisoning organisms. More recently, we have served notice on the meat industry that nitrites and nitrates may be banned unless proof is forthcoming that these additives, which have prior sanction for use in meat products, do not result in the formation of carcinogenic nitrosamines in meat foods during production or preparation for eating.

In addition to purposeful additives, environmental pollutants gain entry to our food supplies through uptake from soil and water, through inadvertent direct contamination, and from misuse. PCB, PBB, dioxins, pentachlorophenols, polynuclear aromatics, trichloro methanes, and a host of other organic compounds can and do enter our foods. Some are toxicologically significant at levels as low as parts per billion. Lead, cadmium, arsenic, zinc, chromium, and other heavy metals are present in our foods as a result of environmental pollution or industrial processes, or in some instances as purposeful additions.

Our most important tool for providing assurance of the safety of our meat food products relative to contamination with residues of

substances is a monitoring program designed to detect the presence of residues in animals, at the time of slaughter. Our FSQS monitoring program provides us with continuing information on residue trends and levels in our meat and poultry supply. This program also helps us to identify individual producers who have failed to properly control chemicals in animals going to slaughter.

Each year we collect, at slaughter, tissue samples from 20,000 to 25,000 animal units. (An animal unit is one red meat animal or five poultry.) On these samples we perform approximately 130,000 laboratory analyses, designed to detect and quantify approximately 60 different chemical compounds. The sampling system is statistically designed to provide a 95-percent level of confidence that a 1 percent or greater violation rate for a particular residue will be detected. Our samples are collected from 2,200 slaughtering plants located throughout the United States, in which over 90 percent of the livestock and poultry destined for human food are slaughtered and inspected by FSQS personnel.

Our monitoring program has been in operation for a number of years now. Therefore, we are in a position to make an assessment of the performance of American agriculture toward reducing the levels of chemical residues in meat and poultry. That performance, to date, leaves much to be desired though some encouraging accomplishments by certain agri-business segments are commendable. For example the broiler industry has done an excellent job of reducing levels of residues of both pesticides and drugs. In 1973, the violation rate for all types of residues in chickens was 2.2 percent. In 1976 the rate was down to 0.4 percent. In turkeys, the violation rate was 1.2 percent in 1973, and was reduced to 0.6 percent in 1976. In ducks, the 1974 rate was 1.8 percent and dropped to 0.3 percent last year.

The livestock industry, on the other hand, has not done as well. Although we are not finding as many pesticide violations as we were a few years ago, we are still experiencing violations due to selected pesticides. For example, dieldrin residues in cattle from the Midwest are a continuing problem.

The most serious residue problems in livestock, however, are not pesticide residue violations but violations of sulfonamide residues in swine and antibiotic residues in cattle.

In swine, we have been finding violative levels of sulfa drug residues in 10 to 15 percent of the animals tested. This violation rate has been relatively constant for several years, in spite of the fact that we twice increased our sampling rate. In dairy cattle we are finding violative levels of antibiotics in 15 percent of the animals tested. The question, of course, is why the high violation rates in swine and dairy cattle.

In swine, sulfa drugs are being used at low levels as feed additives for purposes of promoting growth and preventing atrophic rhinitis. The most probable cause for violations is misuse of the drugs through overdosing or through nonobservance of the withdrawal period. I suspect that farmers and feed mill operators fail to clean feed troughs, holding bins and mixers between batches of medicated and nonmedicated feeds, thus causing cross-contamination and violations. In addition the 7-day withdrawal period may be insufficient for bioelimination by the treated animal and I understand that FDA is reviewing this situation presently.

The antibiotic residue problem in dairy cattle is still under investigation. Our data indicate that antibiotics are being used at therapeutic levels and the violations are commonly associated with the clinical conditions of mastitis and pneumonia. Though we cannot substantiate our suspicions we are of the opinion that farmers are treating sick animals and when they fail to respond to drug therapy the animals are sent to slaughter without withdrawal or with inadequate or fore-shortened withdrawal.

One may ask why is it that the poultry industry has done so much to reduce violations while the red meat industry has done so little. I believe the answer lies in the different structures of the two industries. Over 80 percent of the poultry produced in the United States is under the control of about 200 management systems. Residue violations in such a vertically integrated industry affect a very large number of birds, which receive feed from a common source under similar conditions. The cost to an integrated operator of a violation is huge and therefore a similarly large incentive is operative for establishing effective controls against violative situations.

By contrast there are few integrated beef producers and the industry is composed largely of thousands of independent producers of swine and dairy cattle. The finding of a violative residue level affects a small segment of the total industry. Such a violation causes economic hardship to a single individual after his farm is identified as one from which violative animals issued and only when he attempts to market other animals. His plight, however, is rarely of sufficient magnitude to gain notice within the total industry and little of deterrent value is gained from his experience to influence other small producers to adopt preventive and corrective practices.

What can be done about these residue problems? There are several approaches. In the case of continuing misuse of animal drugs, FDA could limit their use by requiring that such drugs be prescribed and used only under veterinary supervision. This will have the effect of placing an independent third party into the picture. Hopefully, veterinarians accepting responsibility for prescribing drugs will take that responsibility seriously and observe proper dosages and withdrawals.

Another approach is that of a livestock identification system. Without such an identification system we cannot trace animals with violative residues back to their farm of origin. An identification system alone, however, is not enough. We need legal authority to put a hold on a producer's livestock when we have good evidence that his livestock contain illegal residues. Presently, with thousands of producers, we cannot keep track of them all and if a producer chooses to do so he can ship his animals to a distant slaughter market as a means of avoiding herd/farm identification. We are requesting legislative authority to implement these two systems.

When chemicals are used in agriculture, you can safely predict that some people will misuse them and we will find residues in food. Therefore, the surest way to prevent having harmful or potentially harmful chemicals present in our food is to not use chemicals in the first place.

Obviously, this is not possible, since American agriculture could not achieve the high levels of production now existing without chemicals. Nevertheless, I believe it is time for USDA, the "People's Department,"

to spend more on research to find nonchemical means of controlling plant and animal pests and diseases. In addition, we should not be advocating production methods like close confinement rearing of animals, which because of the nature of the practice requires the use of drugs and feed additives.

The time is upon us to reexamine our agricultural policies and practices with a view toward assessing the threats to our health and environment due to a chemically oriented agriculture technology. Where costly or long-term actions may be required to correct the adverse effects of a chemically oriented agricultural practice we should study and measure the future implications of such a practice before we adopt it. Though we are justifiably proud of our national capability to provide food and fiber for our needs as well as those of other nations, we must not lose sight of the fact that errors of the moment committed to achieve short-term gains can have long-term adverse effects. History has repeatedly demonstrated that indiscretions of the past are costly of future human welfare.

ADDITIVES: WHY, WHEN, WHAT FOR

(By Paul F. Hopper,* Group Director, Strategic Technical Planning and Resource Management, General Foods Corporation)

There's not a page of the newspaper, nor a flick of the dial today, that doesn't bring us some new concern, some new "crisis" to worry about regarding the additives in our food supply. "Instant science" is the fad, and the self-proclaimed expert is having his day in the Sun.

There is mass confusion—which at times seems to be bordering on the fringes of mass hysteria. Sound, reflective, scientific judgment seems unable to become factored into the equation of how society looks at the safety issues.

Now, more than ever, it has become apparent that we must take a giant step back from the "trees" and see if we can't gain a better perspective of the "forest." I welcome the opportunity to be part of this program today on "Inside Food Production," and to address my remarks to some of the current dimensions of additives in today's modern food processing.

For the purpose of today's talk, I am going to focus on those additives which are intentionally used in food processing, although much of what I have to say regarding safety will apply equally well to those additives which find their way to our dinner table, without really having been needed or wanted. So let us say then, for the sake of simplification, that an additive is a component of food that man has introduced to enhance the nutrition, the keeping quality, the functionality, the convenience, or the palatability of that food.

When we sweeten a food with sugar or honey, we have technically introduced an additive. When we salt and pepper our meat or potatoes, we are using additives. And so on with baking powder, and vinegar and vanilla and hundreds more items you'll find on your kitchen shelf.

When you come right down to it, your great-great-great grandmother's kitchen was the first food production plant—and she used additives. They took the form of smoke, and salt, and herbs or spices, but she was doing exactly what we food scientists are doing today. She was taking God's bountiful harvest and adding her own touch to make the food more palatable, or to preserve it so there would be something to eat during the long winter.

So why all the furor over additives, if we've had them around so long to fulfill these vital functions? There are a number of reasons. Whether valid or not, our ancestors didn't consider what they were doing as a process of introducing additives. They knew that it worked

*The views expressed in this paper are those of the author and not necessarily those of USDA.

and everybody was better off for having the food available for a longer period of time. Today, we have zeroed in on additives. We have defined them, regulated them, labeled them—and the press has done a good job of indicting them. Additive has become a household word to be uttered with disdain and dismay.

Second, much of what grandma used was taken from the nautical or the botanical world, and assumed, perhaps naively, to be wholesome and safe. Today many of our additives, even those identical to nature, come from man's chemical factory, and therefore automatically become suspect. The writer with a flair for the sensational, will usually find some way to add the words, "derived from the coal-tar industry," if he wishes to evoke a guaranteed negative feeling about a substance.

Third, the combination of new scientific knowledge and the literal application of today's legislation and regulations has resulted in the removal from the food supply of several well known additives. This certainly cannot help but raise doubts in the mind of the public about the safety of additives in general.

So much for our initial thoughts on the subject of additives. Let's get down to the business of their use "inside food production," and then at the end perhaps we'll have time to talk about possibly "a better way" for society to deal with the subject of food additives.

The purpose of additives

As I mentioned before, all food additives are intended to accomplish a functional purpose. These may be classified as follows: nutritional supplements, preservatives and antioxidants, emulsifiers, stabilizers and thickeners, acids and bases, curing agents, leavening agents, maturing and bleaching agents, sequestrants, anticaking agents, humectants, foaming agents, sweeteners, and flavors, spices and colors.

Let's begin to take a look at each of these in order to identify the principle additives within each group and to discuss their purpose and use.

Nutrition

In the harvesting, processing, and storing of certain basic agricultural commodities, the nutritional value may have been affected. It is therefore important to restore these commodities to their original levels of essential nutrients, especially if that foodstuff is an important source of that nutrient in our daily diet.

In addition to simple restoration, certain commodities are deficient in some of the essential nutrients and it is important to enrich these substances—such as flour—so that they can be an appropriate vehicle for improved nutrition in our diet.

Finally, even though certain food and beverage products may not be considered a normal source for a nutrient, we may wish to fortify that product in order to overcome a nutritional deficiency that is present in our population. For one or more of the above reasons, the addition of vitamins and minerals, as well as selected amino acids is extremely important in preventing or overcoming the nutritional deficiencies that exist in our country.

Of special importance are vitamin A, vitamin C, calcium, iron, thiamine, niacin, and riboflavin. In addition, the amino acids methionine and lysine will help to improve the nutritive value of the proteins present in many foods.

Preservatives

It goes without saying that especially now with the ominous spector of world food hunger hanging over our heads we must insure that the food produced in the fields and orchards of our country ends up on the dinner table with a minimum amount of loss. Preservatives play a key role in preventing microbial spoilage and antioxidants serve to prevent chemical deterioration through rancidity.

Among the principally used preservatives are sodium and calcium propionate, sodium benzoate, ascorbic acid, sulfur dioxide and the much discussed nitrites and nitrates used in curing meat.

Among the antioxidants are ascorbic acid, citric acid, BHT, BHA, and the tocopherols of which vitamin E is the most notorious.

Additives for use of textural reasons include emulsifiers, which help to stabilize things such as salad dressing, and thickeners to provide body and mouth feel to many products. Included in these groups are lecithin, the mono and diglycerides, polysorbate-60, vegetable gums and starches and pectin and gelatin.

Acidulants and buffers

Tartness is an important characteristic of many products, especially those with fruit flavor bases. Large quantities of citric acid, fumaric acid, adipic, and malic acids are added to soft drinks and desserts to give them the desired flavor characteristics. In addition, alkalis and buffers such as the phosphates help to adjust the pH of various foods, both for flavor and stability.

Leavening agents, maturing and bleaching agents

These are substances used extensively in the baking industry and serve the purpose of producing a white flour and accelerating the process by which doughs could rise and cakes could be made light and fluffy. Our most common chemical additives in this category are sodium bicarbonate, sodium aluminum sulphate, and calcium phosphate.

Sweeteners

In addition to sucrose and dextrose, several other carbohydrates are commonly used for sweetening food; these include high fructose corn syrup and honey. I need not tell you the fate of the synthetic sweeteners; first with the ban on cyclamates of some 8 years ago, then with the stayed approval of aspartame which has never commercially seen the light of day. Now, with the delisting of saccharin which for all practical purposes seems a certainty for the end of this summer.

Work continues on alternatives such as glycerrizine, monnellin and others, but as of the moment, there is no well accepted approved alternative in the nonnutritive sweetener area.

Others

I could go through a list of additional substances such as sodium silico aluminate, ethylenediamine, tetra acetic acid and others which act as anticaking agents, sequestrants and the like; and of course, talk about the important uses for sodium nitrate and nitrites in providing flavor and color for curing meats as well as inhibiting the growth of the potent microbial poison clustridium boteriridium.

It would take far longer than I have time allowed to touch upon each and every one; perhaps we can cover some of these in the question and answer session to follow.

The quantities used

Depending on what you want to include from the list of flavor chemicals, we can count up to 2,500 compounds that qualify as food additives. It sounds overwhelming—but if we stop for a moment and take a close look at the list, we find that much of what we actually include were old friends to grandma.

Of the nearly 140 pounds of additives in our yearly diet, 102 pounds comes from sucrose—ordinary table sugar; 15 pounds comes from salt, and 13 pounds comes from dextrose, most commonly known as corn syrup. In these three additives alone we find 93 percent of the consumption.

Next on the list comes approximately 30 substances used routinely in the household as well as the production plant, such as yeast, citric acid, baking soda, mustard, pepper and the like. The final 1.5 percent of the additive intake comes from the remaining 1,900 additives—most of which are flavors. In fact, over half of those are consumed at a per capita level of less than one two hundred thousandths of a pound per year.

Some guidelines for use

There are some good manufacturing practices that most companies either formally or informally abide by in their use of additives.

First, no additive should ever be introduced into food unless it has a functional reason for being.

Second, no additive should be used that does not have approval for the intended use, or is considered GRAS.

Third, no additive should be used at a level greater than that needed to accomplish the intended purpose, regardless of the approved level.

Fourth, all formulations should be reexamined periodically to be sure that the additives in use are still needed.

Finally, it goes without saying that appropriate quality assurance and quality control procedures are in place to be certain that the additive is being used at the right level and is being uniformly dispersed throughout the entire production run.

How safe is safe?

When it comes to the question of safety, we need to very clearly define what we mean. It is often felt by the nonscientific public, that there should be a battery of tests which additives should pass through, and then at the end of these, we should be able to positively state that a substance is safe or not safe. The facts are that there is no such thing as absolute safety—and that's true with almost anything we come in contact with in our lifetime—even food itself.

What science does is to design the battery of tests mentioned above, based upon the best available scientific information, using animals as the experimental model, and then to subject the new additive to these tests at various dosage levels. The results are examined to determine if under the intended conditions of use in the food supply, there is any real risk of hazard to man. In extrapolating the data, the FDA usually applies a 100 to 1 safety factor as needed insurance.

Dr. Virgil Wodicka, former Director of the FDA's Bureau of Foods, in addressing a group concerned with food safety last fall explained that:

When we feed a test substance to animals at levels that are harmful, as we decrease the dose, we find that the severity of the damage may diminish and the percentage of animals affected certainly drops off. In fact, it has been widely observed that the probability of an effect is directly proportional to the logarithm of the dose. To illustrate this relationship, let us assume that this relationship has a slope of one. In real life, it is almost never this low. Then say we get one unit of response to one unit of dose. At 10 times the unit dose, we get twice the response. At 100 times the unit dose, we get 3 times the response.

If we now decrease the dose, we reach a level where there is no observed response. This has been termed the no-effect level. Our present regulations call for the establishment of this point and then permit a maximum intake of one one-hundredth of this amount. In effect, this amounts to backing off two logarithm cycles from the no-effect dose. This criterion is used in other countries and in international bodies as well.

In effect, we are using a mathematical model to apply our experimental findings and not a very impressive one. It has a scientific basis, which I shall not take the time to go into, but the evidence supporting this model is scanty. The best justification for it is that to the best of our knowledge, it has not gotten us into trouble. It may have denied us the use of some useful materials, but it has not resulted in toxicity so far as we know.

The need for a model arises from the fact that the doses at which we observe the response are ordinarily far higher than the doses to which we expect people to be subjected. We can see the relationship between dose and response in the range fed, but what is the relationship between dose and response in the range a hundredth or a thousandth or a ten-thousandth of the lowest dose fed? We do not have experimental techniques for finding out, so we have to assume some sort of dose/response relationship and project downward to the dose range of practical interest.

This business of projecting downward is a technique called by mathematicians extrapolation. In science, it is a no no. Science, after all, means the body of things we know. When we extrapolate, we can infer what will happen, but we cannot know. A conclusion of safety, therefore, must inevitably be based on an informed judgment; it does not follow directly from the experimental observations.

A new look at safety criteria

Where do we go from here? Can we continue to live in a world of uncertainty and fear when it comes to the question of additives? There

is a body of concerned citizens that has said, "no." They have taken a hard look at the current trends and said:

No way can we continue to produce an abundant supply of safe, wholesome food, with the confidence of the consumer behind us, if we continue to operate with the antiquated criteria for judging safety that we've been using for the last twenty years.

Spearheaded initially by industry, a steering committee was organized to study the situation. Many different ways were explored, and finally, out of these deliberations a new concept and a new organization was born. It is called the food safety council.

The food safety council is unique in that its total energies are directed toward the development and implementation of sound, realistic criteria by which society may judge the safety of its food supply.

It is further unique in that it is governed by a board that represents a broad, cross-section of society, some of whom may have been in adversarial roles in the past, but who in this organization are jointly dedicating their talents to the positive solution of a global problem.

The first task before the council is the development of a comprehensive set of new scientific criteria for assessing safety based upon the most up-to-date validated scientific information available. To that end a scientific committee has been formed under the leadership of Dr. Virgil Wodicka. Among its members are: Dr. Frank Carlborg, consulting statistician; Prof. Jerome Cornfield, George Washington University; Dr. Peter Elias, Institute fuer Strahlentechnologie; Dr. E. M. Foster, Food Research Institute; Dr. Leon Golberg, Chemical Industries Institute of Toxicology; Dr. Bernard Oser, consulting toxicologist; Dr. John Van Ryzin, University of Wisconsin; Dr. Ian Munro, Canadian Food and Drug; and Dr. Virgil Wodicka, consulting food technologist.

This blue ribbon group of international scientists is assembling and critically reviewing the methodology of food safety evaluation. The committee plans to publish a treatise in the next 9 to 12 months that will have addressed itself to the numerous scientific issues involved. It will serve as the scientific basis on which new criteria for safety can be established.

The food safety council was formed to foster and develop criteria for the safety and wholesomeness of foods and food ingredients, to provide the public, consumers, and food scientists with scientifically sound information, and by developing such information to assist national bodies in formulating sound policies, laws, and regulations to insure the safety, wholesomeness and abundance of foods.

Any organization or corporation within the United States or elsewhere having an interest in the purpose of the council is eligible for membership. In the few short months of its existence, it already has 26 dues-paying members drawn from the food or food-related industries.

The group is governed by a board of trustees currently made up of 26 representatives from industry, academia, consumer organizations, government and professional groups who cover a wide range of talents and expertise.

Once the scientific committee's report has been completed and approved by the board of trustees, the next task of the food safety council will be sharing these criteria with first the rest of the scientific world to be certain that the new criteria are valid, and then to assist in the societal process of how best to use these criteria in the decision-making on matters of safety and wholesomeness.

The bylaws state:

And by developing such (scientific) information, to assist national and international legislative regulatory and other governmental bodies in formulating sound policies, laws, and regulations to insure the safety, wholesomeness and abundance of foods.

There is a bright new hope on the horizon. With continued support of both the industrial and the public sector—working together—we can find a better way.

CONCERNS ABOUT CHEMICALS IN FOOD AND FIBER PRODUCTION

(By Walter Wilcox, Consultant, Office of Technology Assessment)

Few nonfarm people appreciate the vital role chemicals play in the production of food and fiber. Chemical fertilizers and pesticides account for most of the chemicals used in food and fiber production.

Commercial livestock and poultry producers use formulated feeds with mineral and vitamin supplements to meet the nutritional requirements for reproduction, milk and egg production, growth, and fattening. In addition therapeutic drugs are used to treat livestock and poultry and subtherapeutic drug feed additives are now used in more than half of the swine, poultry, and cattle fattening rations.

Synthetic hormone compounds also are used to improve the set of fruit for certain tree fruits, to thin the fruit for other tree fruits, to hasten the maturity of some crops, to prevent suckers on tobacco plants and to defoliate some crops to facilitate harvesting.

Few people are aware that the crops and livestock which make up most of the world's food supply live in a hostile environment shared by about 50,000 species of fungi that cause more than 1,500 diseases.

They are in competition with 30,000 species of weeds throughout the world. More than 1,800 of these species cause serious economic losses each year. About 15,000 species of nematodes attack crop plants and more than 1,500 of these cause damage.

More than 10,000 species of insects create serious crop and livestock losses each year.

In this environment an amazing variety of chemicals have been found useful in food and fiber production. More than 70 generic drugs and chemicals are used to maintain the health and promote the production of animals and animal products used for food. U.S. producers of food and fiber have approximately 8,000 different formulations of pesticides available for their use. Each company that markets a given formulation must have its own registered label. There were probably 30,000 different pesticides registered for use in the United States in recent years. Over 3,500 companies appear to hold Federal registration for one or more products. Pesticide products may be registered by a company for intrastate sale only: an estimated 2,000 products are thus registered in California alone.

Most animal and poultry drug feed additives have come into use in the last 40 years. The great expansion in the use of chemical herbicides also took place in recent years. In the past 10 years the use of both pesticides and chemical fertilizers in the United States has almost doubled. The production and use of herbicides (to control weeds) has grown at the rate of 15 percent a year during the past 5 years. Cur-

rently herbicides account for about 58 percent of the value of total pesticide sales.

In spite of the tremendous increase in the use of pesticides in recent years the Agricultural Research Service estimates that pests, including weeds, continue to cause an estimated 30 percent annual loss in potential production of food and fiber.

It is difficult to estimate the contribution chemicals make to total food and fiber production. The drugs and chemicals used in livestock and poultry production account for about 5 percent of the total livestock products marketed, or \$2 billion a year. Dr. W. C. Shaw of the Agricultural Research Service estimates that agricultural chemicals, including fertilizers, pesticides and growth modifying chemicals are responsible for about 60 percent of the total output of food and fiber in United States.

Regardless of whether agricultural chemicals account for 40, 50, or 60 percent of total food and fiber production their continued use on a large scale is required if current levels of production are to be maintained.

Food and fiber production in the United States has increased by one-half in the past 25 to 30 years. In another 25 to 30 years or between the years 2000 and 2010 another 50 percent increase in production will be needed. Analysts in the Economic Research Service and at the land-grant universities expect farm output to continue to grow at the rate of 1.5 to 2 percent a year primarily as a result of the introduction of improved technologies, including improved genetic strains of plants and animals and a continued growth in the use of livestock and poultry feed supplements, chemical pesticides, and fertilizers.

Recent projections indicate that in another 25 to 30 years U.S. farmers will double their current use of both pesticides and chemical fertilizers. There is no doubt in my mind that if our future national and world food needs are to be met we must find acceptable ways of using larger, rather than smaller quantities of chemicals in food and fiber production.

This can be achieved, in my opinion, with less adverse effect on the environment and on human health than in recent years. I recently attended the oversight hearings of the Subcommittee on Agricultural Research and General Legislation of the Senate Committee on Agriculture, Nutrition, and Forestry. The subject was integrated pest management. Representatives from the Department of Agriculture, the Environmental Protection Agency, the National Science Foundation, the Council on Environmental Quality, the National Agricultural Chemicals Association and from several land-grant universities agreed that substantial progress has been made in recent years in integrated pest management programs.

Representatives from Texas A. & M. University reported that a new short season cotton variety has been developed for the Lower Rio Grande Valley, which permits adequate pest control with 40 percent fewer chemical pesticides than had been used on traditional varieties. Using integrated pest management in the irrigated areas this short season cotton was grown without pesticides, and with less irrigation water and less fertilization than conventional practices. Conventional cotton varieties produced with conventional practices re-

quired 12 applications of pesticides and produced approximately the same acre yields.

At these hearings I learned that Texas cotton growers have organized a Texas Pest Management Association which will take over most of the necessary scouting, monitoring, and advisory services required in an effective integrated pest management program.

In Arkansas, a model of the cotton pest system has been used to develop a computerized forecasting network for the management of the cotton bollworm. This system provides a basis for recommending control measures to cooperating growers within a 50 square mile area: the growers make no pesticide application unless advised to do so by project personnel. In 1976 only one application of pesticide was required. In previous years the community average was 12 pesticide applications. Preliminary reports on 1977 growing conditions indicate similar success in reducing pesticide applications the second year.

Assistant Secretary Cutler told the subcommittee that 80 percent of the USDA insect and plant disease control budget is directed toward fundamental biology and alternative methods of pest control. Dr. Clark of the National Science Foundation emphasized that progress in integrated pest management was dependent, in many cases, on basic research in biology, physiology, genetics, biochemistry, ethology and a number of related sciences and on an interdisciplinary approach to the solution of specific problems.

Progress in integrated pest management will depend in part on development of acceptable means of obtaining the full cooperation of all producers within designated growing areas. The issue of liability on the part of the technical staff providing the advisory services also may cause problems.

The ratio of pesticide and fertilizer prices to grain and cotton prices is much higher than it was 5 or 10 years ago when current traditional practices were adopted. Clearly increases in fertilizer and pesticide prices in recent years have forced producers to look for management practices which economize on the use of both fertilizers and pesticides. They are actively seeking management practices and equipment which will reduce application rates and environmental pollution. Every season improvements are being made in fertilizer placement equipment and pesticide applicators. As more is learned about the requirements for plant growth and the control of each species of insects or weeds, chemicals can and will be used more sparingly because of costs.

There are a few outstanding successes in the development and use of biological pest control methods. Most pilot integrated pest management programs used predator insects as a part of their pest management programs. Available evidence, however, indicates that biological controls are likely to play only a small role in pest management for some time in the future.

Almost all research in biological pest control is conducted by public agencies. Private industry has no incentive for research in this area since the predator species cannot be patented and sold under brand names. Although USDA and the land-grant universities have a substantial research program designed to develop new biological pest controls, some believe that it should be even larger.

Producers will shift to biological pest controls if and when they become economically feasible. In the interim they must continue to use chemical pesticides.

The policy issue is not one of banning all chemicals from use in agricultural production. Rather it is one of assessing the benefits and hazards of specific chemicals and specific uses of certain drugs or chemicals. On the basis of such assessments the continued use of the most hazardous chemicals will be banned by the Environmental Protection Agency or the Food and Drug Administration.

The EPA already has banned the use of several hazardous pesticides. It is now in the process of actively reviewing the benefits and hazards of 20 now being marketed. In a recent report to the Senate Agriculture Subcommittee, EPA indicated it has identified 45 other pesticides for similar review in the near future. The FDA also is in the process of withdrawing approval for the use of several drugs currently used as additives in livestock feeds.

At this point I would like to emphasize that within a substantial range of variation in total U.S. food and fiber production, a 1-percent reduction in supply is associated with more than a 2-percent increase in prices received for the products. If the use of sufficient drugs and pesticides were banned to result in a 2-percent reduction in farm output, farm prices would rise even more proportionally, resulting in an increase in net farm income. This is a point often missed by both producers and consumers.

It is important to appraise the economic impact of banning a specific hazardous chemical, because of its impact on specific producers who have incorporated the use of that chemical into their management practices. For example the banning of antibiotic animal feed additives would adversely affect poultry and swine producers but the ban might benefit cattle producers, because of less competition for the consumer dollar from poultry products and pork. Feed grain producers also would gain from a ban on antibiotic feed additives, as more feed would be required for pork and poultry production.

It is my considered judgement that the economic impact of a substantial curtailment in the use of chemicals in the production of food and fiber after an adjustment period, would fall more heavily on consumers than on the producers. This is not an issue that should divide producers and consumers.

Each specific pesticide and drug feed additive, however, has a unique cliental, usually only a small fraction of the total food and fiber production industry. Most pesticide and drug feed additives have a number of substitutes and the economic effects of their withdrawal depends on efficiency of available substitutes.

Most pesticides also perform specific roles in integrated crop and livestock management systems and their withdrawal may require substantial changes in related production practices. Broilers and eggs are now produced in large concentrated units with substantial dependence on drug feed additives to increase feed utilization efficiency and to prevent the outbreak of diseases. If antibiotics and nitrofurans as feed additives are banned it is probable that current management practices and the structure of the poultry industry will change significantly. Similarly the production of corn with no-till or limited tillage requires the use of substantially more herbicides per acre than conventional tillage practices.

A substantial amount of the environmental pollution from agricultural chemicals is the result of careless and wasteful application prac-

tices. Continuing research and education programs and sharply increased costs will effectively reduce this source of pollution in the future. If the EPA and the FDA find it necessary to ban some currently used hazardous pesticides and animal drugs, as now appears probable, the industry will quickly adjust to the new situation, probably without a serious increase in costs or a significant reduction in production.

Consumers are properly concerned about the safety of their food and the environmental pollution arising from the use of specific chemicals, but they should remember that most of the 50-percent increase in food and fiber production in the past 25 years is attributed to increased use of chemical fertilizers and pesticides.

If the concern about food safety and environmental pollution should result in banning any substantial proportion of the pesticides and animal drugs now in common use, consumers must expect to pay substantially higher prices for substantially smaller quantities of lower quality food and fiber products.

THE ECONOMIC OUTLOOK FOR FOOD

(By Kenneth R. Farrell, Acting Administrator, Economic Research Service,
USDA)

INTRODUCTION

The outlook for retail food prices in 1978 is dominated by four primary factors: (1) Prospects of relatively large supplies of, and thus low prices for, U.S. farm products; (2) continued increases in the costs for marketing inputs, particularly labor; (3) some moderation in retail prices for the foreign foods and fish category; and (4) uncertainties regarding worldwide weather, the outcome of food additives regulations and energy legislation, and the farm production impacts implied by passage of the Food and Agriculture Act of 1977. Overall, we expect average retail food prices in 1978 to increase 4 to 6 percent.

For the fifth consecutive year we expect the farm value of U.S. produced food to hold at about \$56 billion in 1978. Retail prices will, however, continue their seemingly inexorable rise. Also, for the second year in a row, labor costs in the marketing of domestically produced food will likely exceed the farm value of those foods in 1978. This fact alone says a great deal about the current state of the U.S. food price situation and one I will address directly later in this talk.

First I will take a few minutes to talk about food price determinants. Next I will review what happened in 1977. Finally, we will turn to a more detailed examination of the major forces which will influence the retail food price situation next year.

FOOD PRICE DETERMINANTS

The food marketing system in the United States is a very complex part of our vast food and agricultural sector. The system has often been subject to substantial criticism. Consumers blame the system for "high" food prices. Farmers blame it for "low" farm prices. As food prices continue to rise, more people tend to perceive the marketing system as simply "charging a lot for doing very little." What then should we expect to be the relationship between farm and food prices?

Farm prices and food prices are generated in different markets, subject to different supply and demand forces. Farm prices of raw agricultural products are largely influenced by what is produced, both on U.S. farms and worldwide. What gets produced at the farm level is heavily dependent upon rather unpredictable natural forces such as the weather, pest infestations or plant and animal diseases.

The markets in which food is sold operate quite differently. Processors purchase raw agricultural products at prices determined largely

by relative product availability. They then add processing, transportation, and packaging services and ultimately sell a differentiated food product to wholesalers and/or retailers. Wholesalers and retailers, although they may make fewer physical changes in the product form, add still more services.

Clearly then there is good reason for some variability in movements between farm prices and prices for food. It is true that farmers contribute the raw material base for most food products. But it is also true that farm products are only one input into the food marketing process. That raw product must be converted into a form consumers are willing to purchase; it must be delivered to a place where the consumer may obtain it; and, it must be available at a time when the consumer wants it. And these food marketing services involve more than just transporting, processing, and distributing farm products. Food retailers, in particular, have invested billions of dollars in the land, buildings and equipment necessary to complete the present network of modern supermarkets. These stores have been built with the shopper in mind—wide aisles, air-conditioning; and, carryout services. Services such as check cashing and long operating hours (sometimes 24 hours a day) are common. Food prices must, therefore, reflect both the costs for the raw farm product as well as the costs involved in providing marketing services.

Consumer demand, therefore, plays a key, but often neglected, role in the widening farm to retail price spread. As income increases, the consumer demand for food system services can be expected to increase at a faster rate than the demand for farm output. As services become more important relative to the total product sold, the farm level price for the basic raw ingredient becomes less important. In addition, since there is a rather loosely defined biological constraint on how much food people will ingest, the food marketing system has a strong incentive to increase the service component of the products they sell. In fact, the marketing service component is their primary product.

Finally, a few words on the statistical technique used to measure changes in the overall price of food. Just because the CPI for food increases by 6 percent in one year it does not mean that Americans actually pay 6 percent more for food. The CPI is currently based on the 1960-61 purchasing behavior of urban clerical workers and wage earners. The index, therefore, may not reflect either the purchasing behavior of the population who are not urban clerical workers or wage earners or, more importantly, any adjustment consumers make as a result of changes in preferences or prices.

A REVIEW OF 1977

Food prices at retail were impacted most by weather, imported food prices, marketing costs and consumer demand. Much has already been said during this conference about weather but the severe winter which devastated Florida's vegetables and severely damaged their citrus crops contributed significantly to the food price rise. Imported food prices were also influenced dramatically by the weather. The coffee shortage, in particular, is noted although a number of other items have had sharp increases too. Costs of marketing services continued to rise

and were either passed on to consumers through higher prices or were partially offset by lower prices of farm commodities. Again this year, the consumer demand for food and related services has been strengthened by increased disposable and real income.

We experienced relatively stable retail food prices in 1976. But prices began to climb early in 1977. Through July an average rise of 1 percent per month had occurred. Winter vegetables and citrus were contributors but most of the increase resulted from the dramatic increases in prices of imported foods, particularly coffee, and fish. By mid-1977 prices for food at home were up $7\frac{1}{2}$ percent from December with the all-food index, which includes prices of food away from home, up 7.2 percent.

In the second half, larger supplies of farm commodities with lower prices to farmers but wider spreads for U.S. farm food should result in little change in prices of domestically produced food. Coffee prices will be down 7 to 8 percent, but prices of other imported foods and fish continue to increase in the second half. We estimate that prices for food at home will be about 1 percent higher at the end of December than at mid-year; prices for all food will be slightly higher.

For 1977, grocery prices will probably end the year at a 7 percent higher level than a year earlier and average over the whole year about 6 percent above 1976.

Price increases for away-from-home eating, which are influenced more by rising consumer demand and by increases in costs in the non-farm sector are estimated to be up 8 percent over 1976 on the average—a slightly larger increase than a year ago.

The all-food index combining both at-home and away-from-home components will average about $6\frac{1}{2}$ percent above 1976.

Another perspective on the behavior of retail food prices can be obtained by an examination of a market basket of domestically produced food. The market basket contains 65 food items and represents the average quantities of domestic farm-originated foods bought in retail stores during a year by an urban household. It does not include foods consumer buy in away-from-home eating establishments, fishery products, and imported foods such as coffee, tea, cocoa, and bananas.

The retail cost of the market basket of U.S. farm foods will average only about $2\frac{1}{2}$ percent higher this year following the 1 percent rise in 1976. Although prices at the farm level have been higher for some commodities, average returns to farmers for all market basket foods will be slightly below last year. Price spreads, the difference between what the farmer receives and what the consumer pays, will, however, average about $4\frac{1}{2}$ percent higher for the year, reflecting lags in adjustments between farm and retail prices and rising costs for labor and other marketing-related inputs. Thus, all of the 1977 increase in the retail cost of our market basket of foods produced on U.S. farms arise from wider price spreads which reflect higher marketing charges.

Although the retail price of the market basket will increase moderately in 1977, some components of it will show substantial variations in price behavior. Retail prices will average sharply higher for fresh fruits and vegetables (14 percent) and oilseed products (10 per-

cent) reflecting tight supplies and higher farm prices for these commodities earlier this year and widening price spreads in recent months. Small to moderate price increases for cereal and bakery products (1½ percent), processed fruits and vegetables (3 percent), and other highly processed foods are wholly attributable to higher marketing charges. Returns to farmers producing the major raw material in these products have been generally lower this year.

Increases in spreads for many crop products followed sharp decreases in prices to farmers as retail prices were slow to adjust. For example, the price spread for fats and oils products increased 25 percent from the second to the third quarters following the sharp drop in oilseed prices last spring. Despite sharply lower prices for wheat, retail prices for cereal and bakery products are up 1½ percent reflecting wider price spreads. Fresh fruits and vegetables price spreads which rose to record levels following last winter's weather have also been slow to return to their former levels.

Retail prices for livestock-related products have been more stable than crop foods this year. Moderate increases (3½ percent) in prices of dairy products reflect a combination of higher farm prices for milk and wider marketing spreads. Poultry and egg prices will average about the same as last year at both the farm and retail level despite large fluctuations during the year.

Retail prices for red meats have provided some offset to price increases for most other foods in 1977. With a 6 percent decline for pork prices and slightly lower prices for beef (down about one-half percent) and other meat, retail prices for all red meats will average about 2½ percent below a year earlier. Returns to farmers for meat animals will average about 2 percent lower with a 3 percent reduction for marketing spreads also contributing to lower retail prices.

Fish and imported foods, including coffee, tea, cocoa, and about half of the sugar consumed in this country, represent a small proportion of all food consumed. In recent years, however, price increases for these products have contributed proportionately more to the overall increases in retail food costs. In 1974 and early 1975, the world shortage caused sugar prices to increase dramatically, but in 1977 sugar prices are expected to average 10 percent lower than for 1976. More recently, coffee has been the major overall price mover, although tea, cocoa, and fish prices have also advanced sharply. Coffee prices alone will account for about half of the 6 percent rise in average grocery prices in 1977. The entire imported foods and fish group will contribute over three-fifths of the total.

Inflationary forces in the economy continue to impact on operating costs of food marketing firms. The total cost for marketing farm foods is estimated at \$124 billion this year, up \$8 billion from 1976. Prices for labor, packaging, transportation, energy, and most other inputs used in the marketing process are all up in 1977. Prices of intermediate goods and services purchased by food marketing firms will average about 7½ percent higher than a year earlier. Prices for packaging materials, have increased about 6 percent, while prices for energy are up about 20 percent. Rail rates are also somewhat higher than last year.

The largest expense item for food marketing firms in 1977 will be direct labor costs. Increases in hourly earnings of food processing,

wholesaling, and retailing employees slowed slightly to an annual rate of around 8 percent. Although this is the lowest annual rate of increase in 4 years, it exceeds productivity gains and labor costs continue to exert substantial upward pressure on the farm to retail spreads. Total labor costs for marketing the foods which originate on U.S. farms will actually exceed the farm value of these foods for the first time this year. Labor costs could exceed \$58 billion. The farm value will likely remain at about \$56 billion—a level maintained since 1974.

Profits in food retailing have been relatively stable during the past year. Profits after taxes for large food retailing corporations in the first half of this year averaged 0.85 percent of total sales, compared with 0.80 percent last year. Profits after taxes for these corporations increased from 10.2 percent of stockholder's equity in the first half of 1976 to 11.1 percent in the first half of this year.

Profit ratios for food manufacturers were down slightly during the first half of this year. The second quarter profit/sales ratio of 3½ percent was down from 3.7 percent a year ago. Equity profits for these firms were also lower—15 percent compared with 16.4 in the second quarter of 1976.

OUTLOOK FOR 1978

As indicated initially, the food outlook for 1978 is dominated by anticipated large food supplies (both domestic and foreign), increases in marketing costs, some uncertainty about the weather, energy costs, and the impact of recent or pending food legislation. Overall, we expect that food price increases in 1978 will be about the same as 1977 or slightly lower.

World grain output for the 1977-78 crop-year is below last year and total world usage will be higher because of population pressures and economic growth. Despite the record U.S. crop, total world production is expected to be below utilization by only 4 to 6 million tons. U.S. farm production will, however, be sufficient to meet the anticipated export requirements and still provide an adequate supply of major crop commodities for domestic use.

Processed fruits and vegetables, are also expected to be adequate through mid-1978, largely as a result of this year's large crop harvests. The availability of many fresh produce items will be dependent on weather conditions at critical times during the growing season.

With large feed supplies available and feed prices at relatively low levels, larger supplies of pork, grain-fed beef, poultry, eggs, and dairy products are anticipated next year. Although total beef output may be down slightly (if, as expected, cattle producers reduce the number of nonfed animals sent to slaughter) the per capita availability of all animal food products combined will match or slightly exceed the record high levels of 1976 and 1977.

Rising wages of food processing and marketing employees and prices of other inputs purchased by food marketing firms will continue to exert upward pressure on food prices during 1978. Wages of employees in the food industry will probably increase 7 to 8 percent in 1978 as a result of prior wage settlements, cost-of-living adjustments to wages, renegotiated wage agreements and increases in the minimum wage.

In 1978, major collective bargaining agreements covering about a quarter million food marketing workers will expire, mostly for retail

food store employees. Although only one worker in nine is included in major collective bargaining agreements, these agreements have potentially far-reaching effects on the food industry since wages of non-union and management employees tend to follow changes in collective bargaining agreements. New wage settlements in the coming year will be strongly influenced by attempts to protect workers from further inflation and the possible loss of purchasing power. In addition to the provisions of labor contracts, increases in the minimum wage to \$2.65 per hour and higher social security withholding rates will also increase the labor costs of marketing firms.

Labor productivity should continue to increase slightly next year due to the greater volume of food marketed and help offset increases in wages and other cost elements. Productivity gains are likely to be greater in food processing than in food retailing. Productivity growth in food stores has been slowed by a loss of business to eating places, longer hours of operation, and the growth of service-oriented operations in supermarkets, such as bakery shops and delicatessens.

Higher prices for other services, such as energy, packaging materials, and transportation will also contribute to rising marketing costs in 1978. The stable railroad freight rate situation for both food products and farm products that prevailed for much of 1977 ended this fall. Rail rates during 1978 are expected to average 6 to 7 percent above 1977 levels. Rates charged by trucks and barges are also anticipated to rise commensurately.

Pending legislation and international oil prices introduce considerable uncertainty into the energy situation. However, it appears almost certain that the general upward trend in these prices will continue in 1978. Increases in natural gas prices of 10 to 20 percent may result from proposed changes in the regulation of prices. Electric power rates can be expected to increase because of the cost of the required conversion of many steam-generating plants from fuel oil and natural gas to coal. The generally rising prices for all forms of energy will also exert some upward pressure on electric power rates.

Domestic demand for food is expected to continue to expand in 1978 at about the same rate as this year. In addition to the anticipated small increases in the population, disposable personal income is expected to increase about 9 percent, nearly identical to the 1977 increase. The overall inflation rate is likely to be about the same as in 1977. Real consumer income, therefore, would increase by about 3 percent. However, demand expansion for automobiles, housing, and services will continue to absorb most of the overall increase in consumer income, thus moderating its impact on food demand and prices.

Producer response to new farm legislation and the recent international trade developments represent uncertainties which could impact on food prices in 1978 even if weather is good. There is, however, little doubt that the recently adopted sugar program will influence U.S. food prices.

Anticipated developments in the regulation of food safety and composition will also bring about changes in food marketing costs. Saccharin appears to be on the way out as a food additive—just when we cannot tell—creating adjustment problems for consumers, as well as food manufacturers. The use of antibiotics and growth stimulants by

livestock and poultry producers is being questioned and may be prohibited.

Finally, the technique for measuring price increases will be changed in 1978. The Bureau of Labor Statistics has updated the way it will calculate the CPI. Food will be less important in the new index so that fluctuations in food prices will impact less significantly on the overall CPI. The composition of the food index will also be changed. In particular, the base weights will be adjusted to reflect consumer purchasing patterns for a more recent time period—July 1972 through June 1974. Just what these changes will mean for official reports of food price changes is still uncertain.

SUMMARY

We have talked about the three basic sources that contribute to changes in retail food prices—the raw product sector, the marketing sector, and the forces of consumer demand. In 1978 it appears that most of the pressure on food prices will be derived from increased costs in the marketing sector, and relatively less from imported foods and fish than in 1977. As in recent years the farm value of domestically produced foods will be relatively stable meaning that the farm sector will continue to retard retail food cost increases and general price inflation. Under these conditions, average increases in grocery store food prices will likely be in the neighborhood of 1 or 2 percent each quarter through mid-1978 reflecting normal seasonal patterns for farm prices and continued upward push from marketing costs. We expect the average increase in grocery store food prices for all of 1978 to be 4 to 6 percent.

TABLE 1.—FOOD EXPENDITURE COMPONENTS, 1967-77

[In billions of dollars]

| Item | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | Forecast | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|
| | | | | | | | | | | | 1977 | 1978 |
| Personal consumption expenditures for food and beverage ¹ | 109.6 | 118.3 | 126.1 | 136.3 | 140.6 | 150.4 | 168.1 | 189.9 | 209.5 | 225.5 | 241.0 | 253.0 |
| Less alcohol..... | 14.6 | 15.6 | 16.6 | 17.7 | 18.6 | 19.8 | 21.3 | 23.0 | 24.7 | 26.0 | 28.0 | 29.0 |
| PCE for food..... | 95.0 | 102.7 | 109.5 | 118.6 | 122.0 | 130.6 | 146.8 | 166.9 | 184.8 | 199.5 | 213.0 | 224.0 |
| U.S. farm food expenditures ² | 90.3 | 94.0 | 97.8 | 106.0 | 110.8 | 117.9 | 135.3 | 149.2 | 161.4 | 173.2 | 180.0 | 188.3 |
| Farm value..... | 28.8 | 30.4 | 33.7 | 34.8 | 35.3 | 39.3 | 51.1 | 56.0 | 54.9 | 56.3 | 56.0 | 56.5 |
| Marketing bill..... | 61.4 | 63.6 | 64.1 | 71.2 | 75.4 | 78.5 | 84.2 | 93.2 | 106.5 | 116.0 | 124.0 | 131.8 |
| Labor..... | 25.9 | 28.0 | 30.4 | 32.3 | 34.5 | 37.6 | 40.6 | 44.8 | 49.1 | 54.3 | 58.8 | 62.5 |
| Packaging..... | 7.2 | 7.8 | 8.0 | 9.1 | 9.7 | 10.2 | 10.9 | 12.1 | 14.2 | 15.8 | 16.9 | 18.1 |
| Transportation..... | 4.3 | 4.5 | 4.6 | 5.2 | 6.0 | 6.1 | 6.1 | 7.3 | 8.5 | 9.5 | 10.4 | ----- |
| Other..... | 24.0 | 23.3 | 21.1 | 24.6 | 25.2 | 24.6 | 26.6 | 29.0 | 34.7 | 36.4 | 37.9 | ----- |

¹ Department of Commerce, Bureau of Economic Analysis. These estimates of food expenditures differ in several respects from ERS estimates of expenditures for farm foods. The BEA estimates of all food include the value of imported foods, seafoods, food furnished military personnel, and food consumed on farms where produced, but the ERS estimates exclude these items. However, the BEA estimates exclude the value of food furnished hospital patients, students in boarding schools, and inmates of institutions, food furnished by Government agencies to schools and needy persons, food purchased as a business expense, and the value of food served by airlines to their passengers, which the ERS estimates include.

² USDA-ERS.

TABLE 2.—EXPENDITURES FOR FOOD VALUED AT RETAIL STORE PRICES, 1954-76

| Year: | Food at home (millions) | Food away from home | | | |
|-------------------------|-------------------------------|---------------------------------------|--------------------|--------------------------------------|---------------------------------|
| | | Households ¹ (millions) | Total ² | Households ¹ (percent) | Total ² (percent) |
| 1954..... | \$43,965 | \$7,331 | \$11,572 | 14.3 | 20.8 |
| 1955..... | 45,221 | 7,587 | 11,703 | 14.4 | 20.6 |
| 1956..... | 46,762 | 7,984 | 12,110 | 14.6 | 20.6 |
| 1957..... | 49,645 | 8,348 | 12,633 | 14.4 | 20.3 |
| 1958..... | 51,641 | 8,571 | 13,027 | 14.3 | 20.2 |
| 1959..... | 51,739 | 8,724 | 13,126 | 14.4 | 20.2 |
| 1960..... | 52,953 | 8,978 | 13,477 | 14.5 | 20.3 |
| 1961..... | 53,434 | 9,212 | 13,833 | 14.7 | 20.6 |
| 1962..... | 54,429 | 9,615 | 14,396 | 15.0 | 20.9 |
| 1963..... | 54,738 | 10,010 | 14,891 | 15.5 | 21.4 |
| 1964..... | 57,030 | 10,572 | 15,731 | 15.6 | 21.6 |
| 1965..... | 59,950 | 11,710 | 17,371 | 16.3 | 22.5 |
| 1966..... | 63,030 | 12,570 | 18,943 | 16.6 | 23.1 |
| 1967..... | 63,060 | 12,425 | 19,197 | 16.5 | 23.3 |
| 1968..... | 66,668 | 13,236 | 20,617 | 16.6 | 23.6 |
| 1969..... | 70,862 | 13,737 | 21,837 | 16.2 | 23.6 |
| 1970..... | 76,500 | 14,416 | 23,176 | 15.9 | 23.3 |
| 1971..... | 81,183 | 14,978 | 24,300 | 15.6 | 23.0 |
| 1972..... | 87,203 | 16,289 | 26,769 | 15.7 | 23.5 |
| 1973..... | 99,145 | 20,321 | 33,329 | 17.0 | 25.2 |
| 1974..... | 114,079 | 22,775 | 37,719 | 16.6 | 24.9 |
| 1975..... | 126,594 | 26,045 | 42,826 | 17.1 | 25.3 |
| 1976 ³ | 136,779 | 27,975 | 45,926 | 17.0 | 25.2 |

¹ Food away-from-home eaten and paid for by persons living in housekeeping households, valued at retail foodstore prices.

² All food-away-from-home including expense account meals, institutional and military food service, hospital and airline meals, etc., valued at foodstore prices.

³ Preliminary.

RETAIL FOOD PRICES*

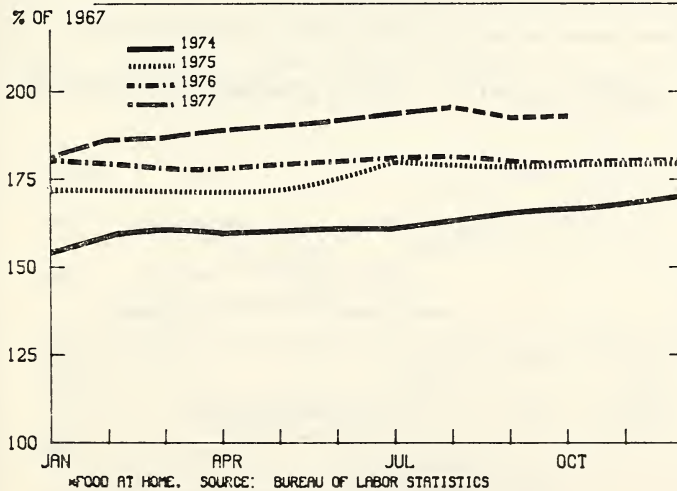
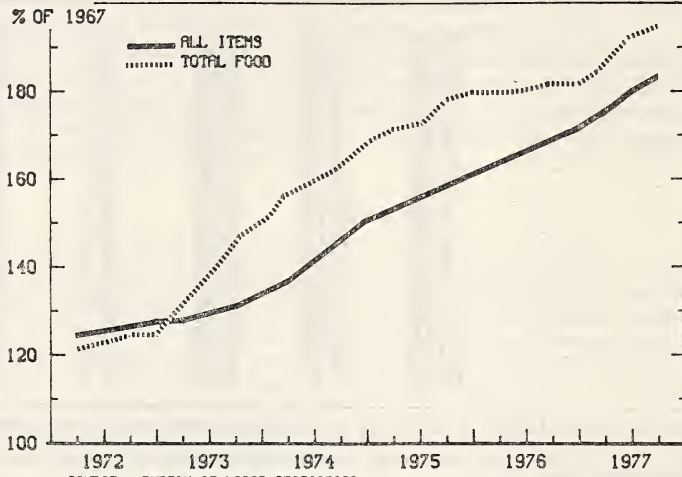


FIGURE 1

CONSUMER PRICE INDEX ALL ITEMS AND TOTAL FOOD

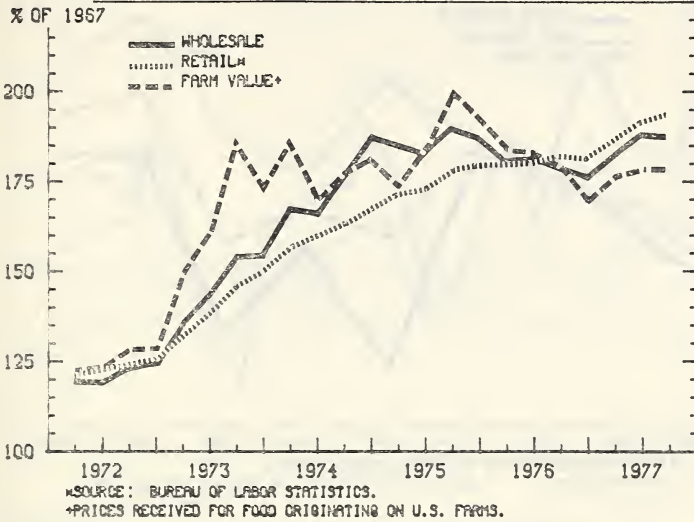


USDA

NOVEMBER 1977

FIGURE 2

FOOD PRICES

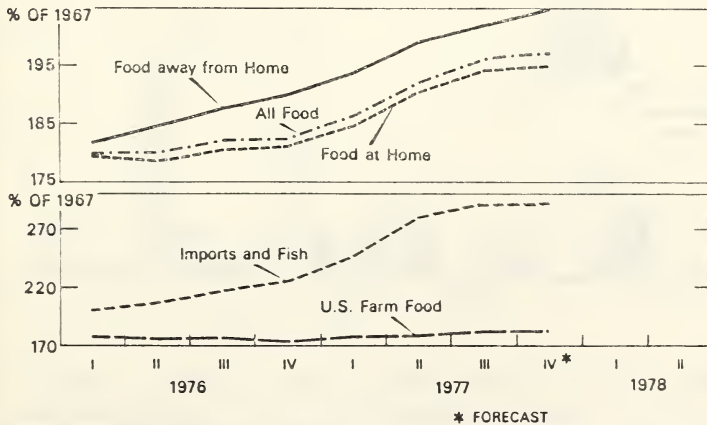


USDA

NOVEMBER 1977

FIGURE 3

MAJOR COMPONENTS OF CPI - FOR ALL FOODS

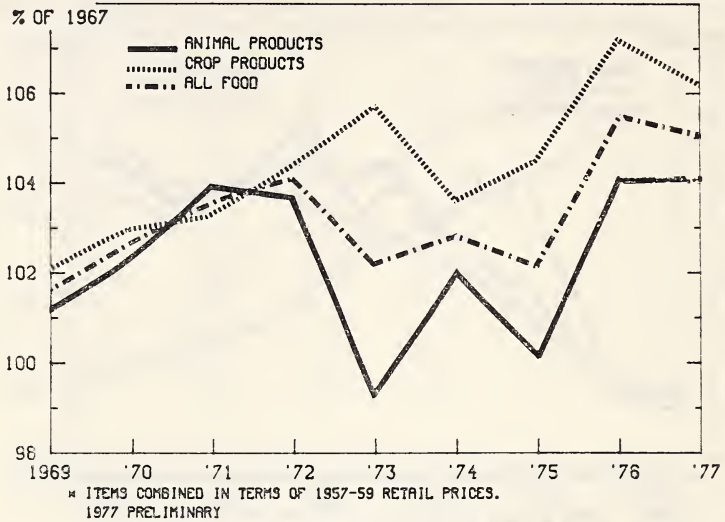


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NOVEMBER 1977

FIGURE 4

PER CAPITA FOOD CONSUMPTION*

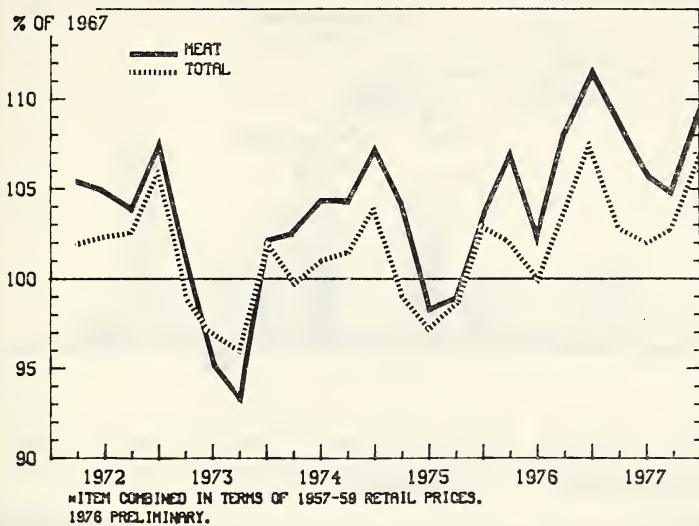


USDA

NOVEMBER 1977

FIGURE 5

PER CAPITA CONSUMPTION OF LIVESTOCK PRODUCTS*



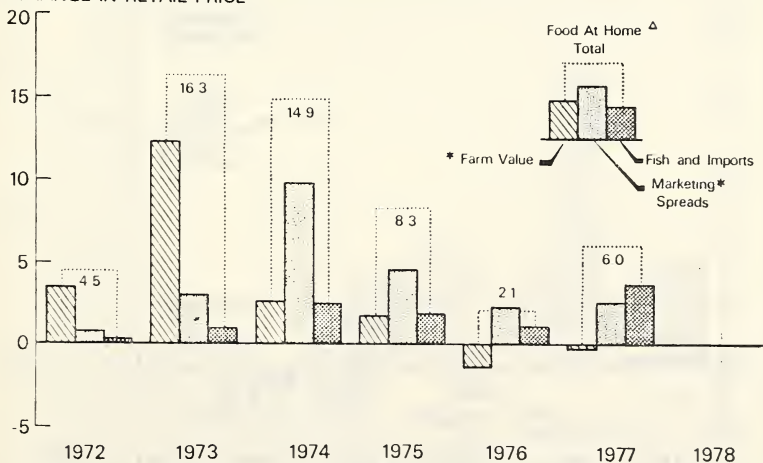
USDA

NOVEMBER 1977

FIGURE 6

CONTRIBUTION OF COMPONENTS TO INCREASES IN FOOD STORE PRICES

% CHANGE IN RETAIL PRICE



△ FOOD AT HOME INDEX, BLS

* MARKET BASKET OF FOODS FROM U.S. FARMS.

1977 AND 1978 FORECASTED.

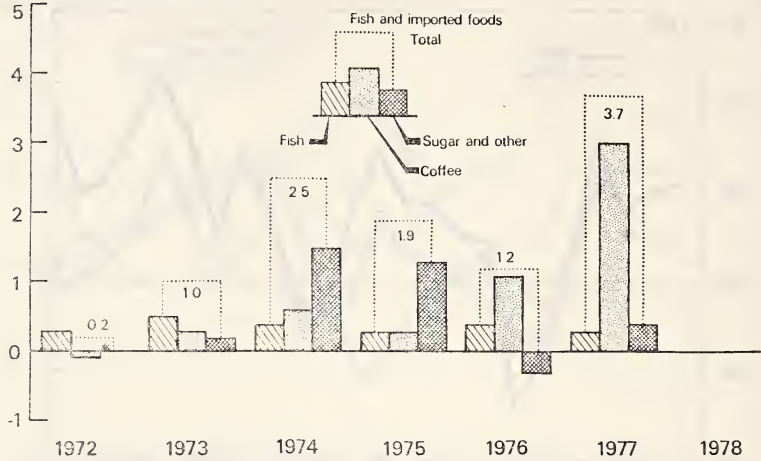
USDA/ERS

NOVEMBER 1977

FIGURE 7

CONTRIBUTION OF COMPONENTS OF FISH AND IMPORTED FOODS, TO INCREASES IN FOOD STORE PRICES

% CHANGE IN RETAIL PRICE



* LESS THAN 0.05 PERCENT.

1977 FORECASTED.

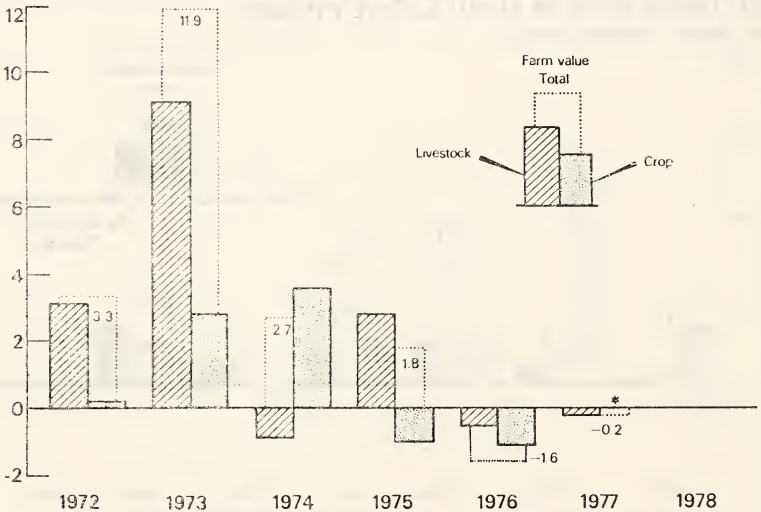
USDA/ERS

NOVEMBER 1977

FIGURE 8

CONTRIBUTION OF FARM VALUE TO INCREASE IN FOOD STORE PRICES

% CHANGE IN RETAIL PRICE ^Δ



* NO CHANGE IN 1977 CROPS. ^Δ FOOD AT HOME INDEX, BLS.

1977 FORECASTED.

FARM VALUE OF MARKET BASKET OF FOODS FROM U.S. FARMS.

USDA/ERS

NOVEMBER 1977

FIGURE 9

CONTRIBUTION OF MARKETING SPREADS TO INCREASE IN FOOD STORE PRICES

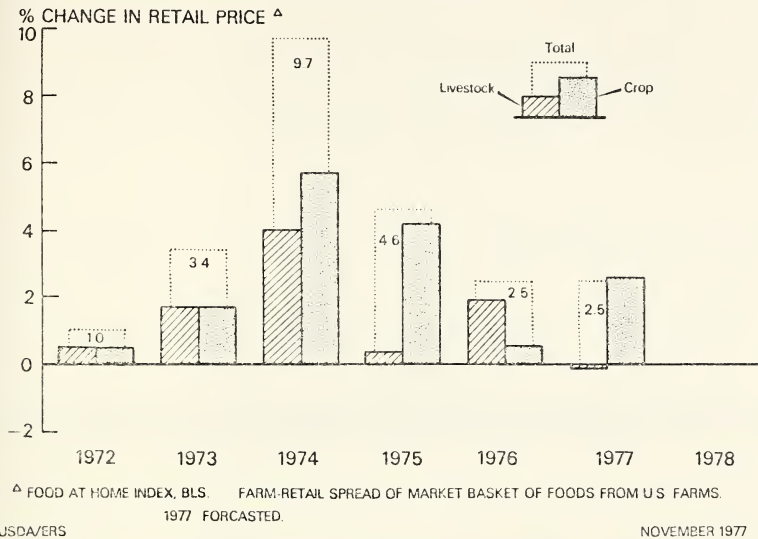


FIGURE 10

U.S. FARM FOODS

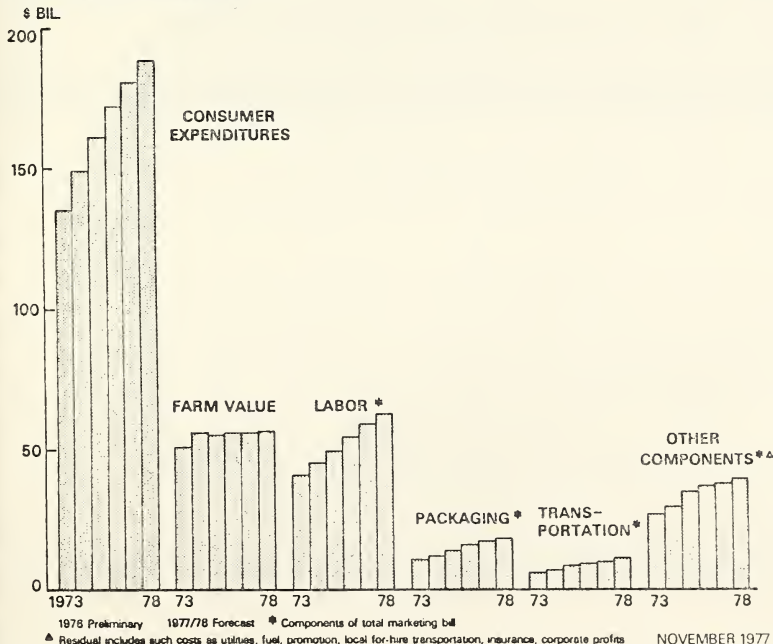


FIGURE 11

**AGRICULTURAL INPUTS,
FINANCE, AND PRODUCTIVITY**

THE WEATHER—WHAT ABOUT 1978?

(By Richard E. Felch, Weather Analyst, World Food and Agricultural Outlook and Situation Board, USDA)

Looking ahead to 1978, the question "What will the weather be?" becomes very important because weather is the major production input which the farmer cannot control. If accurate and timely long-range weather forecasts were available, a farmer could make certain adjustments to overcome potential weather problems, or at least minimize their impacts. However, reliable long-range forecasts of this nature are not available, and it will be many years before they are.

Obviously, there is no way to know what weather patterns will prevail next spring and summer. Climatological records tell us what "normal" weather would be, but it is the year-to-year, or season-to-season anomalies that determine the level of production. However, it is possible to begin making plans and preparations for 1978, including some adjustments for potential weather impacts. The purpose of this presentation is to discuss how information about current weather developments, agronomic knowledge, and probabilistic information about weather events can be integrated to draw some conclusions about production prospects for 1978.

The starting point for evaluating the potential for 1978 is to consider recent and current weather events. For example, the rainfall patterns of recent weeks has helped to determine how much soil moisture the corn and soybean crop of 1978 will have available for growth. It has already determined the amount of fieldwork completed in preparation for spring. It has also determined the condition of the winter wheat crop, which in turn will partially impact how well the crop stands up to winter conditions. In this agricultural weather system there has been a certain amount of "inertia" or momentum already in the system.

The past summer was "mixed" in terms of weather developments. Nearly every part of the country experienced some level of drought damage, but overall production was at or near record production levels. Soil moisture levels were unusually low in some areas throughout the season, but rainfall was very timely, pulling crops through. The Southeast was one of the hardest hit areas, while pockets of very intense drought hit the Corn Belt and Great Plains.

September and October precipitation has very strikingly reversed the drought picture in all areas east of the Rockies. September moisture was unusually heavy in the Pacific Northwest, the northern Great Plains, the Great Lakes region to the Gulf, and in New England. October was a month of extremes with very sharp lines between areas of extreme wet and very dry. Much of the western Corn Belt

and eastern Plains received over twice normal moisture. In addition the area from the Deep South to the Ohio River Valley was also very wet. The Middle Atlantic States finally received much needed drought relief. Temperatures have generally been mild.

The result of all this precipitation activity is a soil moisture situation which shows conditions to be near to well above normal over most of the country. In many areas, excessive wetness has developed to the point of having serious implications for 1978, as well as the short-term implications.

The situation can be described most easily by the Palmer Index map (see fig. 1) which is published monthly in the Weekly Weather and Crop Bulletin, a joint publication of the U.S. Departments of Commerce and Agriculture.

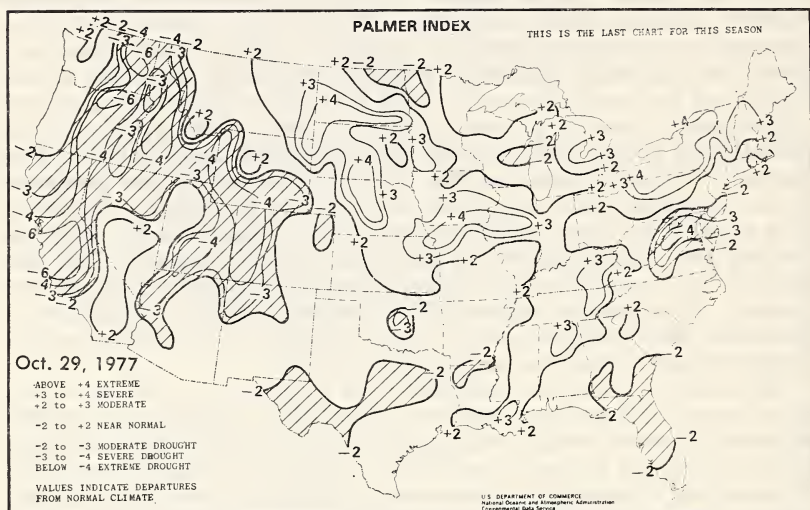


FIGURE 1.—The Palmer Index map for the United States as of October 28, 1977.

The Palmer Index is designed to provide a means for evaluating the scope, severity, and frequency of prolonged periods of abnormally wet or dry weather. It is not always an indication of the current moisture situation relative to plant requirements, but it is an excellent measure of the overall soil moisture situation. It essentially shows the overall "hydrologic picture" which can have very important implications for agriculture particularly in longer term planning. The Palmer Index is also useful because it effectually integrates the effects of the weather over a period of weeks and even months. Positive values of the index indicate that the moisture supply, either from current or antecedent rainfall, exceeded the amount required to sustain soil moisture levels that would be considered normal for the area.

Present drought concerns are focused on the Western States, and in particular the water supply outlook for 1978. A third year of below normal precipitation would be devastating. Although not a major

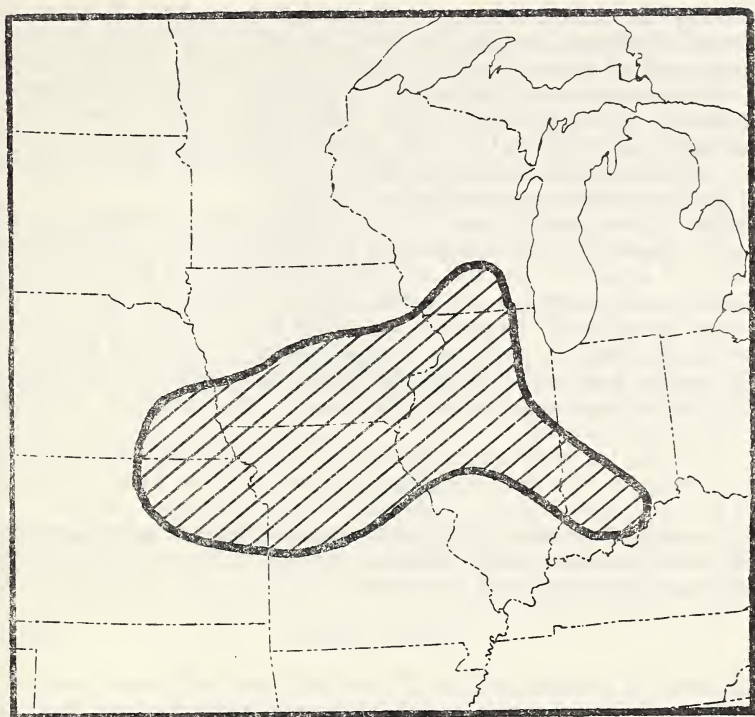


FIGURE 2.—Areas of central United States in which soil profiles are at or above field capacity as of October 28, 1977.

problem at the moment, the southwestern Great Plains is much drier than normal. Some problems were encountered in planting winter wheat because of the dryness. This area will bear close watching during the winter and early spring months.

On the other hand, the moisture situation is adequate to excessive over large areas of the United States from the Plains eastward. The situation has potential implications for 1978 which could be very serious. Figure 2 outlines the area where soils are already at or above field capacity (based on Palmer Index program computations) over the central United States as of October 28, 1977. Unusually heavy precipitation has continued the past 2 weeks making figure 2 conservative.

The very wet weather of this fall has produced conditions as wet or wetter than the fall of 1973. In that particular year the following winter and spring were very wet, record flooding occurred along the Mississippi River and most corn and soybean crops were planted very late. This delayed the crops which were stressed by extreme summer dryness and an early frost. This does not mean the situation will repeat itself in 1978!

The general moisture situation as it exists across the central United States can be described as adequate to excessive. What changes might

be expected in the situation over the next few months? Moisture loss is normally minimal during the winter months, particularly in northern and central areas. Moisture can be lost through runoff, drainage or percolation, and evaporation from the surface. Both percolation and evaporation are reduced by cooler temperatures and there is little water use by vegetation. Once the ground freezes the water is trapped as ice and held until the spring thaw occurs. At the same time, very little winter moisture can penetrate the soil.

Under typical conditions for our major grain producing areas, when the ground finally opens up in the spring, there is still some soil capacity to absorb additional moisture. Typically, by the time planting season rolls around in the Corn Belt soil profiles are full. In 1978, soil profiles will still be nearly saturated at the time that the soils open up. Springtime moisture would typically maintain these saturated profiles and make spring fieldwork very difficult. This will be particularly important because the amount of fieldwork completed this fall lagged normal.

In addition, the warm, open fall so far will keep soils open for some time to come, so the area with excessive moisture in figure 2 may expand further, particularly if present weather patterns persist.

With this information, it is possible to draw some conclusions about production problems which could occur in 1978. The discussion will be limited to wheat, corn, and soybeans.

WINTER WHEAT

The eastern portions of the Wheat Belt are well above normal in moisture and crop growth is well advanced. Some damage may have occurred because of excessive moisture. Root growth may be stunted. Dry areas in western Plains must also be watched carefully. Given the abundant moisture supply, conditions will be excellent for growth when the crop breaks dormancy this coming spring. Given no additional moisture, moisture is sufficient to carry the crop through the major growth of the crop. Only one or two good rains would provide the moisture to carry the crop to maturity.

Excessive moisture could make the crop more vulnerable to winter-killing, if conditions turn extremely cold and dry. Heavier soils would experience some heaving, exposing the plant roots.

Overall prospects for winter wheat are good.

SPRING WHEAT

The primary spring wheat areas generally have normal to above normal moisture. Soil moisture conditions should not cause any major difficulty to field work and seeding. However, moisture must be at least normal or above during spring and early summer.

CORN

Current moisture conditions are such that the probability of some delays in spring field work and planting is reasonably high.

Normal or above normal rainfall in the areas indicated in figure 2 would result in significant nominal delays in planting. The probability

of receiving this amount of moisture is approximately 40 percent. A warm, relatively dry April would be extremely beneficial. This would allow soils to dry sufficiently to allow preparation of fields and planting. This would also allow the surface soils to warm up quickly. Wet soils tend to remain cold. With the current situation, even normal moisture would cause some problems. Today's equipment will allow planting of the entire corn crop within 2 weeks if necessary, but they require drained soils. However, if delayed beyond, May 10, the general rule of thumb is that yields are reduced about 1 bushel a day. Cold wet weather during or after planting also reduces or slows germination and enhances diseases and weed problems.

Given that the crop is planted with minimal difficulty, the excellent soil moisture which exists is in direct contrast to the past year and moisture will not be as critical because most soils will have considerable moisture to carry the crop through the first few weeks of growth. However, the critical period is the reproduction phase and moisture supplies must be ample at that time.

SOYBEANS

Any delay in corn planting would also be reflected in soybean plantings since soybeans are normally planted after corn. Soybeans would not be affected as greatly by late planting, although any delays pushes the reproductive period into the hotter, drier parts of late July and August.

THE WINTER OUTLOOK AND THE LIMITATIONS OF LONG-RANGE WEATHER FORECASTING

(By Donald L. Gilman,¹ Chief of the Long Range Prediction Group, National Weather Service NOAA)

Long-range weather predictions for 2 weeks or more ahead are quite different from short-range forecasts for tomorrow or the next 5 days. The familiar daily weather forecasts are based on a variety of applications of physical laws and a nearly continuous mapping of temperature, wind, moisture, and pressure fields at the Earth's surface and at several levels in the upper atmosphere. Much of the mapping is done at the National Meteorological Center of the National Weather Service here in the Washington area where large computers rapidly process detailed weather measurements made hourly, every 6 hours, or every 12 hours depending on the type of observation. The computers programed with complex mathematical models of atmospheric motions, produce outputs that include various types of prognostic weather maps. Such maps are basic tools used by Government and private forecasters across the Nation.

The science of meteorology has progressed to a point where there is skill in temperature predictions on a day-to-day basis up to 5 days ahead. The Weather Service produces such 5-day forecasts daily on an operational basis. We plan to begin producing forecasts of the average temperature between 6 and 10 days ahead on a scheduled but strictly experimental basis in the next few months. We are optimistic that we can demonstrate some skill in supplementing short-range temperature forecasts this way because results of research at NOAA's Geophysical Fluid Dynamics Laboratory, the Massachusetts Institute of Technology and elsewhere have indicated that there is a scientific basis for such an attempt, and early tests have been favorable.

The limit of scientific predictability of daily weather variations is not precisely known, but evidence strongly suggests that the limit may be on the order of 2 or 3 weeks. In other words, the best scientific evidence indicates it will never be possible to predict day-to-day weather changes a month or more in advance. We are able, however, to provide predictions of average conditions over periods of a month or more, and there is no known limit as to how far in advance this may someday be done. The skill of these predictions now is very limited and depends strongly on the forecaster's experience and judgment and on various empirical techniques, including some formal statistical methods. Physical concepts play a role in shaping these tech-

¹ The views expressed in this paper are those of the author and not necessarily those of the USDA.

niques, but there is no quantitative theory of long-range forecasting—nor have the computational models of the atmosphere that provide the backbone of day-to-day forecasting been shown to be extendable beyond 10 days.

The most common span of a long-range prediction is a month; the Weather Service has been issuing temperature and precipitation outlooks of this kind for 30 years. Four years ago, after 15 years of internal experimental trials, the Weather Service began official release of 3-month, or seasonal, temperature outlooks. The lead time that can be given with these official outlooks is short: 2 or 3 days before the beginning of a month; 5 or 6 days before the beginning of a season. Only the simplest characteristics of the weather for the period can be stated: average temperature, total precipitation. Neither the occurrence of outstanding events during the period, nor their timing, nor even general trends of change have proved to be predictable. The forecasts are stated quantitatively, but only within a few broad, general classes whose limits are numerically defined.

The prediction process has two stages. First the forecaster must sketch an average upper-air circulation pattern for the Northern Hemisphere's temperate and Arctic latitude zones, showing its expected abnormalities. Second, from the upper-air chart the forecaster then infers the surface weather anomalies that should be produced by such a pattern. The first step is the harder of the two. To accomplish it, the forecaster studies the evolution of the changes in circulation over the recent months, displayed on a sequence of time-average charts: monthly, bi-weekly, 5-day. Some of these changes can be extrapolated cautiously into the future. Many can be shown to lead to mutually inconsistent outcomes in different parts of the hemisphere. The inconsistencies may be resolved by appealing to statistics showing which abnormalities of the circulation tend to persist or to disappear, at what times of the year, and at what places. Or they may be resolved by looking for evidence of a sudden change in the number or location of the wide meanders in the hemispheric current or westerly winds aloft. These meanders guide the prevailing motions of storms and fronts.

Monthly and seasonal temperature outlooks made by these methods typically have an accuracy of about 60 to 65 percent; that is, they will turn out on the predicted side of the official 30-year normal a little over 6 times out of 10; whereas a coin-flip will do it about 5 times. Monthly rainfall forecasts typically score between 50 to 60 percent in the same terms. Outlooks of this modest level of skill will help only certain kinds of users who can make subtle adjustments in their activities and still profit. However, the cost of the service is also at a modest level, being but a small fraction of one percent of the Weather Service budget and staff. Most numerous among the subscribers are government officials, agricultural producers and marketers, fuel distributors, and assorted commercial firms.

The monthly outlooks are updated every 15 days and the seasonal temperature outlooks are prepared and published every 90 days, with experimental updates every 30 days.

Now I wish to turn to questions of recent seasonal weather. Last winter generally was the coldest winter for the Eastern United States

since the winter of 1917-1918; and it followed a cold fall also unprecedented since 1917. The severity of these two seasons was associated with a marked and unusually persistent interruption of prevailing westerly winds across North America. Over the Eastern Pacific Ocean, prevailing winds aloft from early fall to late winter were diverted northward to Alaska. The return flow around a persistent ridge of high pressure in the western parts of the United States and Canada swept southward down across central Canada and penetrated deep into the Southern United States. The result was record warmth in Anchorage, record cold in Miami, and the failure of winter storms to reach the West Coast and replenish the mountain snowpacks of the West.

The abnormalities of the upper-wind patterns, while exceptionally strong and long-lasting, were by no means atypical in their general pattern. Although some interesting hypotheses have been advanced, we know of no demonstrated explanation for the intensity or persistence of these anomalies, nor does it seem likely that there is any simple or single explanation. Temporary equilibrium in a complex physical system generally involves a multitude of factors, none of which may be clearly dominant.

Although deep physical insight in diagnosing and forecasting remains out of reach, enough empirical evidence was available to make successful general statements about fall and winter in 1976-77. The Weather Service's temperature outlook for last winter was issued on schedule in late November 1976 and called for below normal temperature over most of the Eastern United States, as had its fall outlook. Quite similar predictions for the winter were made by scientists at the Scripps Institution of Oceanography and the Woods Hole Oceanographic Institution.

Winters generally vary quite irregularly from year to year. Long-term trends, tendencies to resemble the previous year, and other simple types of regularity account for only a small part of these variations. One can reasonably say, therefore, that the climatic odds against the recurrence in 1977-78 of a similar and equally severe winter pattern must be rather long, nearly as long as those against the original occurrence. We would set them at more than 30 to 1. Can anything be added in the way of an explicit forecast?

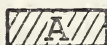
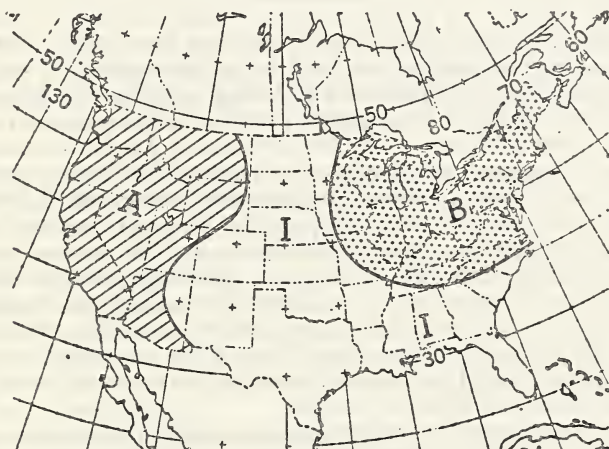
In September we undertook a first, very preliminary, look toward the coming winter, based on the regional anomalies of the hemispheric upper-wind patterns of this summer, last spring, and the last two winters and the statistics of their likely carryover effects into the winter. The scattered clues we found pointed toward a national temperature pattern in which the northeastern quarter of the country and the Central Mississippi Valley seemed the most likely to experience a colder winter than normal, and the Southwestern quarter most likely to enjoy a mild one. This tentative picture, which should not be given more than a 55 percent chance of verifying at any individual city, will be superseded on November 28 by our regular winter outlook. In the preparation of that final outlook, the hemispheric upper-wind patterns of the autumn months will be the important new ingredients.

Until the final winter outlook (covering December through February) is ready, the closest approximation to it is an experimental 90-day

temperature outlook for the period November through January, shown on the accompanying chart. It differs from the preliminary view of two months ago mainly in adding warm conditions in the Northwest and removing them from the Southern Great Plains.

OUTLOOK FOR 90-DAY AVERAGE TEMPERATURES

November 1977 through January 1978



Above Normal, favored by 4 to 3 odds



Below Normal, favored by 4 to 3 odds



Indeterminate, equal odds for warm or cold

"Normal" refers to the average temperature of the years 1941-70. The odds cited in this experimental outlook have been shortened slightly from those that can be quoted for our regular calendar season outlooks.

NOAA, National Weather Service
Long Range Prediction Group

CLIMATE CHANGES—A COMMENTARY

(By William Gasser, Agricultural Economist, Economic Research Service,
USDA)

There has been much discussion in the last few years about possible future weather patterns that may be unfavorable for agriculture. Most present short-run forecasts and long-range projections of world crop production do not incorporate possible future changes in climate. There has been criticism of the Department of Agriculture and others for assuming normal weather in projections of future crop production.

If the basic structure underlying weather is assumed to be constant, the impact of weather could be measured through statistical analysis of historic temperature and rainfall data, and its relation to agricultural production data. However, this approach ignores contentions that the basic climate factors underlying weather are changing, and that our data series are not long enough or comprehensive enough to identify long-run weather cycles. We in ERS are currently working on both the statistical analysis of historical data, as well as the broader question of long-run climatic change.

We have attempted to isolate "weather-related" variations in grain yields using standard regression techniques to factor out the effects of changes in physical resources, the quantity and quality of inputs, and improvements in technology. The variations in grain yields unexplained by this process of elimination are assumed to be the effect of deviations in weather from normal or mean levels. Combining these weather-related variations in yields with area data translates yield variations into production variations. Annual variations in total grain production have generally ranged within 2 percent and have never exceeded 6 percent during the period covered by our data. The netting out of positive and negative deviations in different regions at the world level in any one year, however, understates the impact of weather within regions. In the Soviet Union, Oceania, and India the year-to-year deviations sometimes exceed 20 percent.

We are also evaluating the possible impacts of long-run climatic changes. There are several hypotheses about possible change in future climates. One is that the cooling trend of recent years will continue. Meteorologists seem to be in general agreement that there was a temperature increase from the 1880's to the 1940's (about 0.6 degrees Celsius in the Northern Hemisphere, with the largest increases in northern latitudes). But since the 1940's, temperatures have declined, although there is some evidence of a leveling off in recent years.

Another hypothesis is that a warming trend soon will begin—if it has not already started—as a result of the so-called "greenhouse" effect of carbon dioxide accumulation. Only about one-half of the carbon dioxide from human activity (primarily from burning fossil

fuels) leaves the atmosphere. The rest accumulates, permitting solar radiation to enter our atmosphere, but trapping the longer-wave outgoing radiation. Some scientists foresee a rise of one or two degrees Celsius over the next few decades if use of coal, gas, and oil continues to increase at recent rates. A result of such a warming trend would likely be shifts in temperature and rainfall patterns, but the impact on agriculture and other sectors of the economy has not been well quantified.

Another hypothesis relates to sunspot cycles, for which an apparent double cycle periodicity of 20–22 years has been identified. There is speculation that the double cycle is related to drought in the U.S. High Plains and that another major drought may be “due.” Thus far, there is no agreed-upon physical explanation of how sunspot cycles could affect the weather of the High Plains, and most of the world’s droughts do not seem to show a recognizable recurrence pattern.

Another major issue relates to variability of weather—probably a more important issue than cooling or warming trends over the next quarter century. There is some evidence of a low level of variability in recent years, especially in the United States. Some scientists contend that higher variability should be expected in the future. If so, this could mean greater fluctuation in crop output—with obvious implications for grain reserve programs, export sales, foreign aid programs, etc. Increased variability could also complicate crop breeding programs—the need to breed for a wider range of temperature and precipitation conditions.

What can be done when confronted by such conflicting theories? The very fact of controversy among the leading authorities indicates that science doesn’t know with certainty the cause of global climate changes. There are no comprehensive theories, suitable models, or sufficient actuarial experience to answer adequately the questions or supply the information needs of national policymakers. Research may help in the future, but we need the best possible answers now. We have decided to pursue the alternative of listening to expert judgments—a plea many of the experts have been making. But then the experts have an obligation to speak in more than vague generalities—which at one time might have been appropriate to create awareness of the problems. What is needed now are expert judgment forecasts—subjective though they necessarily must be—on some of the controversial issues relating to possible changes in climate and its variability, and how such changes might impact on agriculture or other sectors of the economy. In general, it’s not very useful to tell a policymaker that since some unfavorable event has happened in the past it can happen again. An informed, expert judgment on the likelihood, or the odds for a repetition of the event would be much more useful to the decisionmaker weighing the costs, benefits, and risks of alternative policies.

It’s against this background that a novel research project is now underway in the Research Directorate of the National Defense University, Fort McNair, Washington, D.C. The project is a joint effort of the Department of Agriculture, the Department of Defense, and the National Oceanic and Atmospheric Administration. In detailed

consultation with the experts, we hope to elicit best judgments on the probabilities of changes in climate and its variability and the resultant effects on U.S. and world food production and on other related issues affecting national policy to the year 2000.

We sent out to a panel of climate experts a set of questions dealing with significant climatic factors, including variability. We tried to identify weather developments which some experts have said may occur and which may significantly affect world food production, and to frame precise questions about such developments. The time span covered by our queries runs to the end of this century. We asked for the experts' judgments about climatic changes with their quantitative (probabilistic) estimates of the changes. We have analyzed and aggregated their responses to produce the group's best judgments on these matters. An interim report has been prepared and sent out to the panel of climatologists for their review and comment before publication of the final report in the next month or two.

The questions we sent out to the panel of climatic experts related to global temperature; temperature by latitudinal bands; the influence of carbon dioxide and turbidity; precipitation; precipitation variability; midlatitude drought; Asian monsoons; Sahel drought; and length of growing season. We asked the experts to assign probabilities of changes and to explain the reasons for their answers. On each question we asked them to rate their own expertise on the questions and also to rank other leading experts.

I want to stress that we are not attempting to discover scientific truth by consensus. We are dependent on experts' judgments because science hasn't yet established well-tested theories that permit confident predictions about future weather beyond the period of a few days. Therefore, we concluded that it was essential that we make the effort to find out what the best informed judgments can tell us about those weather-climate issues that are most relevant to important public concerns about the future of agriculture and the world food situation. The issues are here now, and decisions must be made on the basis of the best information available. As expected, we have found a wide range of expert opinions on some climate issues. We are ahead of the game to the extent that we have quantified perceptions of climatic change, but we are on notice that the current state of knowledge does not permit one to make sharp, confident forecasts of certain climate variables. Nevertheless, through this study we hope to achieve a better quantitative understanding of the possible range of agricultural, food, and economic situations which depend upon such variables.

Our preliminary analysis of the responses of the climatic experts indicated that judgments about future average global temperatures were pivotal in setting the stage for other climatic variables. Using the judgments on global temperature changes we have constructed five climate scenarios, based on panelists' different perceptions relative to likely temperature changes, ranging from "large" global warming to "large" global cooling, with temperature ranges and associated probabilities. The probability for each scenario is essentially a measure of the confidence, expressed collectively by the climate panel, that the global temperature change between around 1970 and around 2000 will lie in the range indicated by the scenario. Conditional probabilities

with respect to climatic variables other than the overall global temperature have been developed and are included in each scenario.

Panelists whose probability estimates tended toward the moderate or large warming scenarios explained their reasoning primarily in terms of the likely long-term dominance of the CO₂ warming effect, in relation to a possible slow natural cooling. Respondents who leaned toward the likelihood of global cooling hypothesized that the warming effects of CO₂ might not materialize to the extent suggested by those supporting a strong warming trend or that the CO₂ warming effects would be overshadowed by natural long-term, solar-induced climatic cycles leading to cooling. The middle scenario—that of little change in the mean annual global temperature—is predicated primarily on the warming effects of CO₂ balancing the effects of a natural cooling cycle.

An analysis of the respondents' estimates of likely temperature changes by latitudinal bands indicates, as expected, that global temperature fluctuations tend to be far more pronounced in the polar regions than in low latitudes. In other words, the poles are more sensitive to climate change. A number of the respondents judged that the poles may be expected to experience a change at least several fold larger than the global average. Several respondents also commented that any changes are likely to be somewhat less in the Southern Hemisphere than in the Northern Hemisphere because of the thermal inertia provided by the proportionally greater ocean surface.

An analysis of the respondents' estimates of the probability of change in precipitation amounts and variability indicates a high level of uncertainty not only with respect to the amount of the change but in many cases even with the direction of the change; this is particularly true with respect to possible changes in variability from year to year. The panelists' responses, however, suggest fairly strong support—although by no means unanimous—for the existence of a quasi-20-year periodicity in the frequency of drought occurrence in the United States. But the causal mechanism of this apparent periodicity was clearly in dispute among the panelists.

We are now prepared to evaluate our climate information in terms of possible impacts on world agricultural production. We, in fact, have started on this task and are working with another group of experts on crop and weather relations to develop an appropriate analytical procedure. We have set up a panel of crop experts and have asked them to evaluate the impact of given temperature and precipitation changes on the yields of grains and soybeans in eight countries.

When the task is done, which we expect to take several months, we will have data about possible future grain yields in major producing areas of the world which we can then compare with the projections that we and others have already made on the basis of assumptions of no change in the climate between now and the year 2000. Our analysis will grow season. We asked the experts to assign probabilities of changes with the probabilities arrived at by our experts, on world grain production, trade, and related issues. We hope to have it all done by February.

OUTLOOK FOR FARM INPUTS

(By Robert D. Reinsel¹ Program Leader, Economic Research Service, USDA)

The general tone of the input markets can be characterized as slack demand and excess production capacity. These two forces will likely result in a much slower rise in prices for most inputs and perhaps declining prices for some.

While input price increases are expected to slow, prices received by farmers are not expected to show much strength and farmers, particularly those producing crops will be facing a cost price squeeze. For 1977, net farm income in current dollars will likely be near 20 billion and, with the current market situation, income during the first half of 1978 is not likely to improve.

As a result of the less optimistic income picture, lenders can be expected to scrutinize loan applications more closely and to be more conservative in making loans. This will also impact on the demand for operating and capital goods.

Given the level and outlook for net income, purchases of intermediate and long-term capital items will likely drop. Purchase of short-term production items will slacken modestly but remain stronger than purchases of capital inputs.

I will turn now to the specific outlook for pesticides, energy, farm machinery, and fertilizer.

PESTICIDES

For 1978, we expect ample supplies of pesticides at slightly higher prices. This forecast is based on the following considerations.

Substantial additions to capacity have been constructed in the past several years. This increase permits ample production of nearly all types of pesticide materials. In addition, raw materials for producing basic pesticide chemicals have been adequate and no shortages are anticipated.

On the price side, low margins at the distributors' level last season are reported as a reason for causing several distributors to discontinue pesticide sales. Thus, the remaining distributors can be expected to maintain a rather firm commitment to prices that will insure an adequate margin.

On the demand side, changes in quantity demanded are now largely a function of acres of crops grown and the expected set-aside program for feed grains could have a substantial negative impact on demand for herbicides.

¹ Contributors of materials include: Patricia Devlin, Paul Andrienas, Ted Eichers, and John Mahan.

In addition to basic market forces, regulations continue to be a very important factor in pesticide markets. The Environmental Protection Agency (EPA) has decided to continue the registration of Trellan. This major cotton and soybean herbicide had been under review for removal from the market. However, annual benefits to farmers have been estimated to exceed the risk of continued use and this material will continue to be available.

A decision to extend the period for reregistration of pesticide materials has, at least, provided temporary life for many pesticide materials. And, the reregistration process should not affect the availability of any product for the coming season.

In future seasons, such products as toxaphene, lindane, endrin, and chlorobenzilate could be removed from the market if presumptions against reregistration are not rebutted.

MACHINERY

Demand for farm machinery is expected to be very soft next year and only minimal price increases resulting from increased costs of materials and labor are anticipated.

Most farmers can be expected to closely review their farm equipment replacement plans and they will likely replace only those items that are absolutely essential for continued operation.

This expectation is based on observations of the situation for the first 8 months of 1977. Sales of all tractors for the January–August period were off 3.5 percent from a year earlier. Sales of four-wheel drive tractors dropped 24 percent, and for two-wheel drive tractors of under 100 horsepower were down 8 percent. Partly offsetting these declines were sales of two-wheel drive tractors of more than 100 horsepower which increased 11 percent, January through August sales of other equipment—combines, cornheads, forage harvesters, mower conditioners, and manure spreaders were all down ranging from 4 to 21 percent below last year's levels.

Although machinery sales were off, prices continued to rise and as of June 15, 1977 were up an average of 10 percent over a year earlier. Prices of large tractors were up 11 percent and prices for other machinery increased 6 to 14 percent.

In 1978, dealers in farm equipment will be facing a rather difficult problem. Much of their supply is already floor planned and they will be under heavy pressure to move this equipment out of their lots. To do so, many can be expected to raise trade-in allowances on used machines and to grant more lenient terms of payment. As a result, dealer margins can be expected to decline and if volume also falls some of the smaller dealerships may be in serious financial condition.

With the market for new equipment very soft, dealers can be expected to attempt to maintain income by increasing charges for machinery repairs, an area where farmers have much less flexibility in postponing necessary service.

Prices of replacement parts have risen rapidly and the total cost of machinery repairs will likely continue to rise sharply in the next year.

Farm operators would be well advised to schedule known maintenance needs and work with their dealers in order to avoid additional charges for overtime on hasty unscheduled repair operations.

FERTILIZER

Lower farm commodity prices and the reintroduction of set-aside programs for wheat and a possible set-aside for feed grains will impact on fertilizer demand in the 1977-78 fertilizer season, causing total domestic consumption to remain at or below use in 1976-77. The reduced demand and increased production capacity for fertilizer suggest that prices will be under strong downward pressure into the spring season.

Fertilizer application rates are expected to increase on acres planted, but increased application rates will not likely offset the reduction in total requirements caused by putting land in the set-aside programs.

Nitrogen fertilizer

In 1976-77 farmers used about 10.6 million tons of nitrogen, some 2 percent more than in the previous year. However, the net supply including the difference between imports and exports rose by more than 8 percent. Inventories of nitrogen materials thus increased sharply and nitrogen-fertilizer prices, particularly anhydrous ammonia declined, dropping from \$188 per ton retail in May to \$177 per ton in October. At the end of August, nitrogen inventories at the manufacturing level approached 2 million tons, about 300,000 tons above year earlier levels. From June to the end of August, inventories increased by over 600,000 tons, while ammonia prices continued to fall. By the beginning of calendar year 1978, ammonia production capacity is expected to exceed 23 million tons up nearly 18 percent from January 1, 1977. For the 1977-78 fertilizer year, domestic nitrogen consumption is forecast at 10.4 to 10.7 million tons and the net domestic supply could reach the 12 million ton mark adding further to carryover inventories.

With such a demand/supply outlook, it seems likely that nitrogen prices will decline sharply. As prices fall, some manufacturers could find it unprofitable to continue operation and what appears to be a major oversupply problem could turn into a much more closely balanced market.

Phosphates

In 1976-77, farmers used over 5.6 million tons of P_2O_5 , an increase of 8 percent over the previous year. Although production increased sharply, net domestic supply was held to a slower rate of increase by an estimated 15 percent increase in exports. Thus, the fertilizer year closed with little change in inventory.

Production increases anticipated for 1977-78 will largely be offset by increased exports and net supply may remain close to 1976-77. With consumption estimated at 5.4 to 5.7 million tons, the market for phosphates looks much stronger than that for nitrogen and prices are expected to remain stable.

Potash

Domestic potash consumption rose 12 percent in 1976-77, with most of the increase made possible by increased imports from Saskatch-

ewan—nearly 1 million tons of K_2O above the previous year. At the end of August potash inventories were slightly below those of a year earlier.

October potash prices remained essentially unchanged from a year earlier and no major change is anticipated.

Consumption for 1977-78 is expected to range between 5.5 and 5.8 million tons.

ENERGY

Energy inputs remain a most critical concern for the agricultural sector. With energy legislation pending, an uncertainty as to future supplies and prices permeates the fuel situation. However, the general trends of relatively tight supplies and associated increasing prices may be expected to continue. The various energy forms used most intensively in the agricultural sector face different supply constraints, with the situation for some fuels being more serious than for others.

Natural gas

The extreme cold of last winter brought on predictions of natural gas shortages. While another such winter may not be likely, the natural gas shortage has not gone away. The Federal Power Commission in August projected that 1977-78 delivery of natural gas could fall 170 billion cubic feet below the level of last winter and that curtailments of gas contracted for delivery might run to 23 percent as compared with 21 percent a year ago, with most of this impact falling on the industrial sector.

However, recent indications from major natural gas pipelines moderate this projection somewhat. By increasing storage, planning for emergency gas purchases and through increased supplies, excessive industrial curtailments should be avoided. Some curtailment of industrial users can still be expected, especially on days of peak usage.

Industrial, commercial, farm and residential users can expect higher prices for the gas they receive. In the event of another very severe winter, some food processors such as meat packing plants and milk processors could find their gas supply curtailed. If they have no alternative fuel capability, farmers could end up dumping milk and delaying the shipment of livestock. Irrigators in many areas are likely to experience difficulty in obtaining natural gas in preferred quantities, due to curtailments or high prices.

Prices for natural gas have been increasing rapidly, having taken a quantum leap in 1973-74, and increasing steadily since. Because natural gas prices deviate so much from State to State and from user to user, it is impossible to arrive at a typical price paid by farmers. However, prices in unregulated areas have more than doubled between 1973 and 1975, and have increased significantly in regulated areas. The regulation issue is under congressional discussion along with other energy legislation. However, natural gas prices may be expected to increase 10 to 20 percent for agricultural users.

LP gas

The outlook situation for LP gas is closely tied to that for natural gas. Traditional LP users such as agriculture find increased competition for this fuel resulting from natural gas shortfalls. There is a problem of LP supplies being diverted to industrial users as they try to adjust to natural gas curtailments.

Propane inventories as of September 1976 were down considerably from 1 year ago. In September 1976, the American Petroleum Institute reported inventories of 95,125 thousand barrels while the comparable figure for 1977 was 86,675 thousand barrels, a decline of almost 9 percent. However, crop drying is proceeding as usual this fall, with no major disruptions reported thus far. Farmers should maintain full storage tanks however, in anticipation of possible short-term supply bottlenecks.

LP gas prices almost doubled between 1973 and 1974, disrupting a rather stable historic trend. Since then, prices have increased from 7 to 18 percent a year. The price reported by SRS, USDA for July 1977 was nearly 40 cents a gallon. A 10 to 15 percent price increase may be expected for the coming crop year. Very tight supplies will exacerbate the situation.

Diesel and gasoline

No supply problems are indicated for either diesel fuel or gasoline for the coming year. Farmers should be able to obtain all needed supplies with little difficulty. Again, another unusually cold winter could throw a monkey wrench into the distribution system causing spot disruptions, but this would be unexpected. The major price jump for gasoline and diesel also occurred in 1973-74. Since then, increases have leveled off to the 5 to 10 percent range, with diesel prices increasing somewhat more rapidly than gasoline. Indeed the price differential of these fuels has been narrowing gradually. October 1977 figures for bulk delivery gasoline and diesel were 57.8 cents a gallon and 45.3 cents a gallon respectively. Five to 10 percent price increases should be expected next year.

Electricity

The strong growth in electricity demand experienced over the past few decades has begun to level off. This slowing increase in annual demand is likely to permeate all sectors.

Reserve margins for all regional areas appear adequate to meet winter peak demands for 1977-78. Reserve margins will decrease for the summer of 1978 but they still appear sufficient to meet electricity demand for the coming crop year.

TABLE 1.—CHANGES IN FARM TRACTOR AND MACHINERY UNIT PURCHASES, UNITED STATES, 1975 TO 1976 AND JANUARY-AUGUST 1976 TO JANUARY-AUGUST 1977

| Type of machinery | Change in machinery unit sales (percent) | | |
|--------------------------|--|--|---------------------------------------|
| | 1975 to 1976 | January-August 1976 to January-August 1977 | Change in price, ¹ 1976-77 |
| Tractors: | | | |
| 2-wheel drive | -5.3 | -2.1 | +7-11 |
| 4-wheel drive | -9 | -24.0 | +6 |
| All tractors | -5.0 | -3.5 | |
| Combines | -1.5 | -16.4 | 10-12 |
| Forage harvesters | -14.6 | -4.1 | +15 |
| Corn heads | -8.1 | -21.1 | +9 |
| Balers | +1.2 | -5.3 | +6 |
| Mower conditioners | +1.1 | -3.6 | +6 |
| Manure spreaders | +1.2 | -20.7 | +7-8 |

¹ June 15 each year.

TABLE 2.—UNIT SALES AND PRICES OF SELECTED FARM MACHINERY ITEMS AND TOTAL NET FARM INCOME, 1971-76

| Year | Net farm income (billions) ¹ | | Farm sales (thousand units) ³ | | | | Farm prices of ⁴ | | | | | Tractors (composite under 100 hp) |
|------|---|---------------------------------|--|----------------------------|------------|------------------------|-----------------------------|--------------------------------|-------------------------------|----------------------------|---------|---|
| | Current prices | Constant prices ² | Wheel tractors | Self-propelled combines | Hay balers | Tractors (50-59 hp) | Tractors (90-99 hp) | Medium capacity combines | Large capacity combines | Hay balers (Pto driven) | | |
| 1971 | \$14.6 | \$12.4 | 132 | 28 | 28 | \$6,100 | \$9,660 | \$13,270 | \$17,820 | \$2,510 | \$6,623 | |
| 1972 | 18.7 | 15.2 | 157 | 29 | 32 | 6,270 | 10,000 | 14,700 | 19,300 | 2,860 | 6,967 | |
| 1973 | 33.3 | 25.1 | 197 | 35 | 37 | 6,390 | 10,800 | 16,600 | 22,200 | 3,280 | 7,530 | |
| 1974 | 26.1 | 17.3 | 174 | 32 | 29 | 7,000 | 12,900 | 20,700 | 27,100 | 3,920 | 8,970 | |
| 1975 | 24.3 | 14.6 | 161 | 33 | 26 | 8,610 | 16,100 | 27,300 | 35,400 | 4,320 | 10,543 | |
| 1976 | 20.0 | 11.4 | 153 | 33 | 22 | 9,160 | 17,400 | 31,000 | 41,100 | 4,590 | 10,917 | |
| 1977 | 19.5 | ----- | 148 | 27 | 21 | 9,860 | 19,200 | 34,700 | 45,200 | 4,590 | 11,880 | |

¹ Total net farm income including change in inventory values, "State Farm Income Statistics,"

USDA, ERS.

² Purchasing power in 1967 dollars.³ Sales reported by Farm and Industrial Equipment Institute.⁴ Farm prices reported in "Agricultural Prices," USDA, SRS. Tractor prices as of Mar. 15, and baler combine prices as of June 15 each year.⁵ Estimated based on January-August sales.

TABLE 3.—INDEX OF SALES AND PRICES OF SELECTED FARM MACHINERY ITEMS AND TOTAL NET FARM INCOME, 1971-76
[Index 1971=100]

| Year | Net farm income ¹ | | Farm sales ³ | | | Farm prices of ⁴ | | | | | |
|------|------------------------------|------------------------------|-------------------------|-------------------------|------------|-----------------------------|---------------------|--------------------------|-------------------------|-------------------------|-----------------------------------|
| | Current prices | Constant prices ² | Wheel tractors | Self-propelled combines | Hay balers | Tractors (50-99 hp) | Tractors (90-99 hp) | Medium capacity combines | Large capacity combines | Hay balers (Pto driven) | Tractors (composite under 100 hp) |
| 1971 | 100 | 100 | 100 | 100 | 114 | 103 | 104 | 111 | 108 | 106 | 105 |
| 1972 | 128 | 123 | 119 | 104 | 132 | 105 | 112 | 125 | 125 | 114 | 114 |
| 1973 | 228 | 202 | 149 | 125 | 104 | 115 | 134 | 160 | 152 | 131 | 135 |
| 1974 | 179 | 140 | 132 | 114 | 93 | 141 | 167 | 206 | 199 | 156 | 159 |
| 1975 | 166 | 118 | 122 | 118 | 79 | 150 | 180 | 234 | 231 | 172 | 165 |
| 1976 | 137 | 92 | 116 | 118 | 75 | 162 | 199 | 261 | 254 | 183 | 179 |
| 1977 | 134 | ----- | 112 | \$ 96 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

¹ Total net farm income including change in inventory values, "State Farm Income Statistics, USDA, ERS.

² Purchasing power in 1967 dollars.

³ Sales reported by Farm and Industrial Equipment Institute.

⁴ Farm prices reported in "Agricultural Prices," USDA, SRS. Tractor prices as of Mar. 15, and baler combine prices as of June 15 each year.

⁵ Estimate based on January-August sales.

TABLE 4.—FERTILIZER SUMMARY, UNITED STATES, 1973-74—1977-78

[1,000 short tons]

| Item | 1973-74 | 1974-75 | 1975-76 | 1976-77 | 1977-78 |
|--|---------|---------|---------|---------|---------------|
| Nitrogen: | | | | | |
| Domestic supply | 10,094 | 9,343 | 10,481 | 10,748 | 11,400 |
| Imports | 1,068 | 1,198 | 1,219 | 1,841 | 1,950 |
| Total available supply | 11,162 | 10,541 | 11,700 | 12,589 | 13,350 |
| Exports | 1,269 | 1,115 | 1,239 | 1,250 | 1,450 |
| Net supply | 9,893 | 9,426 | 10,461 | 11,339 | 11,900 |
| Consumption (demand) | 9,157 | 8,601 | 10,412 | 10,642 | 10,400-10,700 |
| Unidentified disappearance | 736 | 825 | 49 | 697 | 1,500-1,200 |
| Phosphate (P₂O₅): | | | | | |
| Domestic supply | 6,869 | 7,230 | 7,345 | 8,033 | 8,150 |
| Imports | 315 | 274 | 221 | 248 | 220 |
| Total available supply | 7,184 | 7,504 | 7,566 | 8,281 | 8,370 |
| Exports | 1,581 | 1,860 | 2,176 | 2,500 | 2,600 |
| Net supply | 5,603 | 5,644 | 5,390 | 5,781 | 5,770 |
| Consumption (demand) | 5,099 | 4,507 | 5,228 | 5,622 | 5,400-5,700 |
| Unidentified disappearance | 504 | 1,137 | 162 | 159 | 370-70 |
| Potash (K₂O): | | | | | |
| Domestic supply | 2,604 | 2,287 | 2,313 | 2,584 | 2,600 |
| Imports | 4,114 | 3,847 | 3,910 | 4,955 | 4,500 |
| Total available supply | 6,718 | 6,134 | 6,223 | 7,539 | 7,100 |
| Exports | 947 | 848 | 911 | 994 | 1,000 |
| Net supply | 5,771 | 5,286 | 5,312 | 6,545 | 6,100 |
| Consumption (demand) | 5,083 | 4,453 | 5,210 | 5,833 | 5,500-5,800 |
| Unidentified disappearance | 688 | 833 | 102 | 712 | 600-300 |

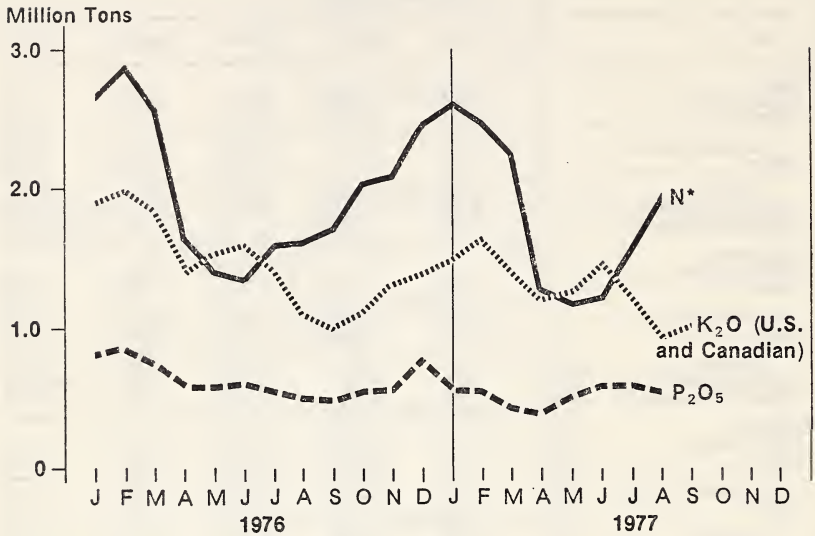
CHART 1

FERTILIZER PRODUCER INVENTORIES BY MONTHS, 1976-77

[Million tons]

| Month | N | | P ₂ O ₅ | | K ₂ O | |
|-----------------|------|-------|-------------------------------|-------|------------------|-------|
| | 1976 | 1977 | 1976 | 1977 | 1976 | 1977 |
| January | 2.64 | 2.61 | 0.80 | 0.56 | 1.88 | 1.48 |
| February | 2.87 | 2.47 | .85 | .55 | 1.99 | 1.62 |
| March | 2.57 | 2.23 | .75 | .42 | 1.83 | 1.40 |
| April | 1.64 | 1.26 | .58 | .40 | 1.40 | 1.20 |
| May | 1.40 | 1.16 | .57 | .51 | 1.53 | 1.24 |
| June | 1.34 | 1.20 | .59 | .59 | 1.59 | 1.45 |
| July | 1.58 | 1.60 | .55 | .60 | 1.41 | 1.20 |
| August | 1.60 | 1.92 | .50 | .55 | 1.11 | .92 |
| September | 1.69 | ----- | .47 | ----- | 1.00 | 1.00 |
| October | 2.01 | ----- | .54 | ----- | 1.11 | ----- |
| November | 2.09 | ----- | .65 | ----- | 1.31 | ----- |
| December | 2.45 | ----- | .76 | ----- | 1.39 | ----- |

Fertilizer producer inventories by months, 1976 and 1977



Does not include urea

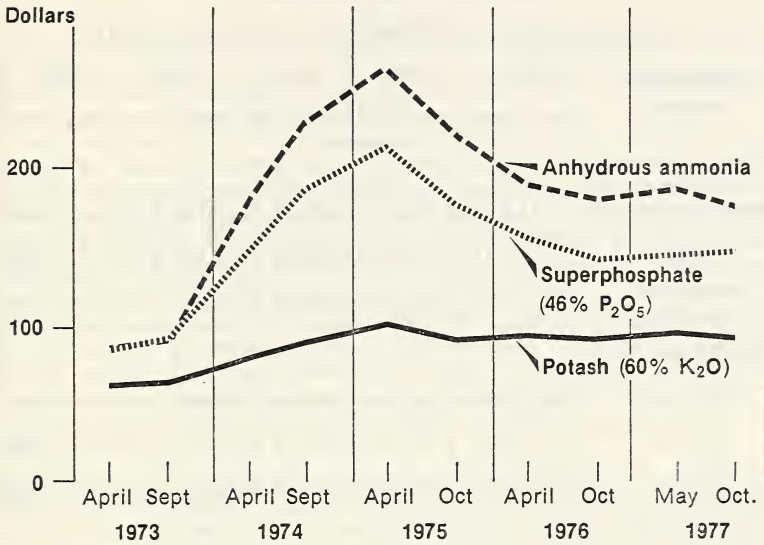
CHART 2

AVERAGE PRICES PAID BY FARMERS FOR SELECTED FERTILIZERS, UNITED STATES, 1973-77

[Dollars per ton]

| Selected fertilizers | 1973 | | 1974 | | 1975 | | 1976 | | 1977 | |
|---|-------|----------------|--------|----------------|--------|--------------|--------|--------------|--------|--------------|
| | April | Sep- tember | April | Sep- tember | April | Octo- ber | April | Octo- ber | May | Octo- ber |
| Anhydrous ammonia..... | 87.60 | 92.50 | 183.00 | 229.00 | 265.00 | 219.00 | 191.00 | 182.00 | 188.00 | 177.00 |
| Superphosphate (46 percent, P ₂ O ₅)..... | 87.50 | 94.10 | 150.00 | 188.00 | 214.00 | 179.00 | 158.00 | 146.00 | 148.00 | 150.00 |
| Potash (60 percent K ₂ O)..... | 61.50 | 63.60 | 81.30 | 91.00 | 102.00 | 94.30 | 95.90 | 94.20 | 96.90 | 94.50 |

**Average prices paid by farmers for
selected fertilizers, United States, 1973-77**



**Production capacity of selected nitrogenous
fertilizers, United States, 1970-78**

Million Tons

| Item | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |
|-------------------|------|------|------|------|------|------|------|------|------|
| Anhydrous ammonia | 16.8 | 16.5 | 17.1 | 16.9 | 16.8 | 17.5 | 18.8 | 19.6 | 23.2 |
| Urea | 4.2 | 4.4 | 4.5 | 4.2 | 4.2 | 4.9 | 6.0 | 6.7 | 7.1 |
| Ammonium nitrate | 9.1 | 8.0 | 7.7 | 7.7 | 7.7 | 8.2 | 8.4 | 9.3 | 9.7 |

**Average prices paid by farmers per 20-pound unit
of nitrogen contained in nitrogenous materials,
United States, 1973-1977**

Dollars

| Nitrogenous Fertilizer | 1973 | | 1974 | | 1975 | | 1976 | | 1977 | |
|---------------------------|-------|------|-------|------|-------|------|-------|------|------|------|
| | April | Sept | April | Sept | April | Oct | April | Oct | May | Oct |
| Sulfate of ammonia | 2.69 | 2.90 | 5.37 | 6.68 | 7.22 | 6.10 | 4.79 | 4.62 | 4.97 | 5.00 |
| Ammonium nitrate | 2.13 | 2.31 | 4.15 | 5.07 | 5.55 | 4.66 | 4.03 | 4.09 | 4.30 | 4.28 |
| Urea | 1.93 | 2.11 | 4.02 | 5.10 | 5.36 | 4.46 | 3.65 | 3.69 | 3.72 | 3.66 |
| Anhydrous ammonia | 1.07 | 1.13 | 2.23 | 2.79 | 3.23 | 2.67 | 2.33 | 2.22 | 2.29 | 2.14 |
| Nitrogen Solutions | | | | | | | | | | |
| 28% N | 2.05 | 2.18 | 4.11 | 4.89 | 5.68 | 4.32 | 3.89 | 3.86 | 4.11 | 4.00 |
| 30% N | 1.94 | 2.03 | 3.70 | 4.53 | 5.10 | 4.20 | 3.77 | 3.73 | 4.03 | 3.96 |
| 32% N | 2.09 | 2.25 | 3.97 | 4.78 | 5.25 | 4.50 | 4.09 | 4.09 | 4.25 | 4.24 |

OUTLOOK ON COSTS OF COMMODITIES

(By Ronald D. Krenz,* Agricultural Economist, Economic Research Service,
USDA)

It has been traditional for USDA economists to make estimates of cost of production. However, a formal mandate to develop cost estimates was initiated by the Agriculture and Consumer Protection Act of 1973. This act directed the Secretary of Agriculture to conduct cost of production studies on wheat, feed grains, cotton, and dairy commodities, and to update these cost estimates annually.¹ As the initial step in meeting this requirement, the Economic Research Service conducted a nationwide farm survey on cost of production in 1974 for the commodities named above. Similar surveys have been made in 1976 on hogs and beef cattle, and in 1977, on potatoes, sugar beets, and tobacco.

Just prior to the legislative mandate, ERS decided to establish a budget system to develop and maintain crop and livestock budgets with standard formats and procedures for all major crop and livestock commodities by geographic region. The purpose of this system was to develop and maintain a set of uniform costs mainly for research purposes. This effort has developed into what is now known as the Firm Enterprise Data System (FEDS). The system uses computer programs to build and update budgets for the major producing areas for a large number of crops and for several types of livestock.

ERS cost estimates

The cost of production work in ERS presently consists of two major components: (1) Farm surveys of costs as called for by the 1973 Agriculture and Consumer Protection Act and (2) The FEDS system of computerized budgets. Some cost of production surveys are taken by ERS almost every year, with each commodity being surveyed approximately every fourth year. During the intervening years, costs are updated with the FEDS budgets. Surveys of cotton, food grains, feed grains, and oilseeds are planned again for 1979.

The FEDS system maintains approximately 500 crop budgets depicting costs of producing cotton, feed grains, food grains, and oilseed crops throughout the United States. These budgets are updated annually and copies are distributed to farm management extension specialists and research people in all of the land-grant institutions and to industry people throughout the United States. Comments from these people help to keep these cost estimates on track.

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¹ Section 808, Public Law 93-86, 93d Congress, Agriculture and Consumer Protection Act of 1973.

About a year ago, a set of budgets was developed, covering milk production in 24 regions of the United States. These budgets were used to estimate dairy production costs for 1975 and 1976. These budgets will be updated to provide dairy production costs for future years.²

Budgets for hogs and beef cattle were added to the system this summer. They have been used to develop estimates of the cost of producing hogs and beef and the reports are currently being reviewed for publication.

In the coming year, budgets will be added for tobacco, sugar beets, and potatoes using data obtained from cost of production surveys that were taken of these crops during this past year.

The computerized budgets used by FEDS are being developed primarily with cost data obtained from the ERS cost of production surveys. Subsequently, each year, the yields and prices of purchased inputs are updated using data obtained from the Statistical Reporting Service. Also, the use of fertilizers on four major crops—cotton, corn, soybeans, and wheat—is updated each year from data published in the fertilizer situation report. In addition, this year, estimates of use of chemicals in crop production were updated from a new ERS survey of pesticide usage.

This two-pronged approach of surveys and budgets has now been in operation for about 3 years.³ Cost estimates developed a year ago for 1975, 1976, and 1977 were useful to the Congress this past year in their deliberations in developing the Food and Agricultural Act of 1977. Target price levels for wheat, corn, and cotton were based on cost of production considerations. The 1977 act also specifies that future adjustments in target prices for wheat, feed grains, cotton, and rice will be based on changes in production costs. The 1977 act is specific in requiring that variable costs, machinery ownership costs, and overhead costs be used in the adjustment process.⁴

COST ESTIMATES

Costs since 1974

Figure 1 illustrates changes in per acre costs since 1974 for the major feed grains, oilseeds, cotton, and wheat. These costs are expressed as an index, using 1974 as the base. The costs included are the total of the variable production costs, machinery ownership costs, and general farm overhead costs. Land and management costs are not included.

Since 1974, the biggest increase in per acre costs occurred in 1975, when costs of these crops increased approximately 26 percent. This was caused by rapid increases in prices of farm machinery, fertilizer, chemicals, and fuel. Costs have continued to increase since 1975 but at a slower rate.

² See "Costs of Producing Milk in the United States, 1975 and 1976." Prepared by the Economic Research Service, USDA, Senate Committee on Agriculture, Nutrition and Forestry, Committee Print 83-252, February 1977.

³ See Agricultural Economy Report No. 338, "Cost of Producing Food Grain, Feed Grain, Oilseeds, and Cotton, 1974-76, ERS, USDA," June 1976, and "Costs of Producing Selected Crops in the United States—1975-1976, and Projections for 1977." Prepared by the Economic Research Service, USDA, Senate Committee on Agriculture and Forestry, Committee Print 80-606, January 1977.

⁴ For a description of future target price adjustment procedures, see "Commodity Program Provisions Under the Food and Agricultural Act of 1977," Agricultural Economy Report No. 389, Economic Research Service, USDA, Washington, D.C., October 1977.

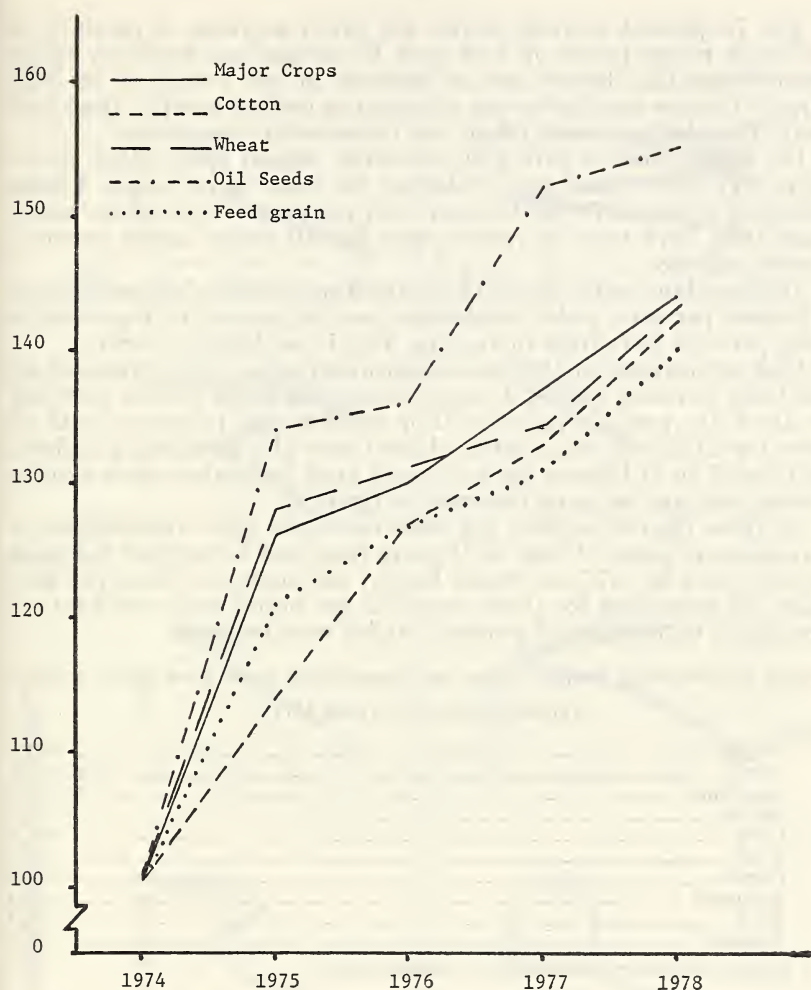


FIGURE 1.—Index of Farm Production Costs.

Projections for 1978

Per acre costs are projected to average approximately 6 percent higher in 1978 than in 1977 (table 1). The rate of increase in per acre costs in 1978 is projected to be greatest for the feed grain crops as a group than for other groups of crops. The major cost increases in 1978 will be due to expected increases in prices of fuel, machinery, and labor, whereas prices of chemicals and fertilizer are expected to change very little. The two crops with the highest percentage increases, oats and flax, use very little chemicals or fertilizers. Thus, the inputs that are expected to increase in price the most constitute almost all of the purchased inputs that are used on these two crops.

The 7.5-percent increase shown for grain sorghum is partially a result of rising prices of fuel used for irrigation. Soybeans could demonstrate the slowest rate of increase in per acre costs in 1978 largely because seed prices are expected to decline sharply from last year. This decline would offset cost increases in other items.

Per bushel costs in 1978 will, of course, depend upon yields. Actually, 1977 was a good year yieldwise for most major crops. Yields reported in the 1977 SRS October crop production reports are better than they have been in recent years for all crops except peanuts, barley, and rice.

With nonland costs expected to increase an average of approximately 6 percent per acre, yields would also have to increase by 6 percent to keep per-unit costs from increasing. This is not likely to occur.

Cost projections for 1978 were determined using yields projected on the basis of recent trends. A range around the trend yield is included to allow for possible variation. For instance, the projected yield of corn for 1978 is 92 bushels per planted acre plus or minus 5 bushels, or from 87 to 97 bushels per acre. Such yield projections were used in the per unit cost estimates presented in figure 2.

As these figures indicate, per bushel costs are quite variable due to variations in yields. Yields in 1978 are projected to be about the same as they were in 1977 for wheat, barley, and soybeans. Since per acre costs are increasing for these crops, the per bushel costs could go up, but only 2 to 3 percent if projected yields were realized.⁵

TABLE 1.—*Projected change in per acre production costs from 1977 to 1978*¹
[Percent change 1978 versus 1977]

| | |
|----------|------|
| Crop: | |
| Wheat | +6.1 |
| Corn | +5.2 |
| Sorghum | +7.5 |
| Barley | +6.9 |
| Oats | +8.9 |
| Rice | +6.3 |
| Cotton | +6.4 |
| Soybeans | +2.4 |
| Flax | +8.4 |
| Peanuts | +3.1 |

¹ Variable, machinery ownership, and overhead costs.

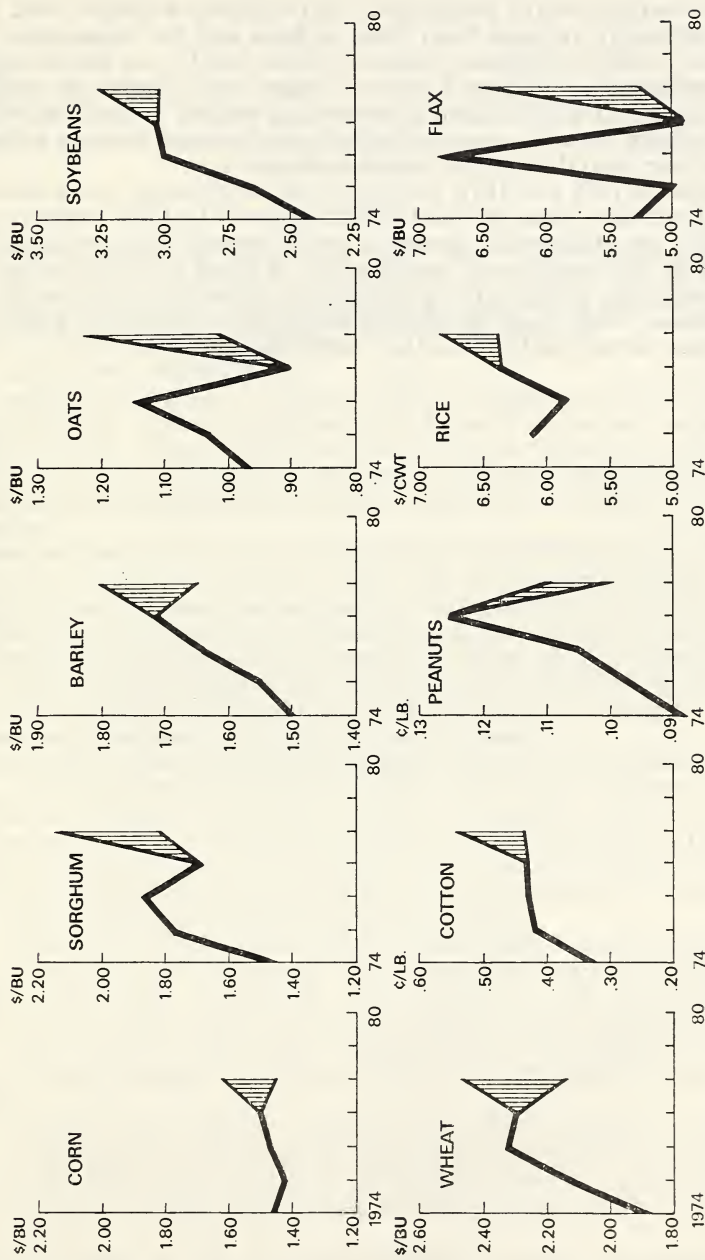
Rice and corn, yields in 1978 are projected to be slightly higher than 1977. Per acre costs are also increasing for these crops, but if trend yields are realized per unit costs would increase only 2 to 3 percent.

Yields of peanuts were much below normal in 1977, thus, if yields return to normal in 1978, costs per pound will be decreased considerably.

Yields of cotton, sorghum, oats, and flax were unusually good in 1977 and projections are lower in 1978. Thus, with increasing costs per acre and lower yields, costs per unit of these crops could increase by as much as 10 to 20 percent.

⁵ Per bushel estimates for 1977 are based on preliminary yield estimates reported in "Crop Production" by SRS on Sept. 12, 1977.

NONLAND PRODUCTION COSTS PER UNIT *



* VARIABLE, MACHINERY OWNERSHIP AND OVERHEAD COSTS.

SUMMARY

Estimating costs of production in agriculture is a difficult task. Costs are extremely variable from farm to farm and for some items, data are very difficult to obtain. Costs vary from year to year due to changes in input prices, changes in use of inputs and changes in yields.

The present ERS method of estimating costs of production includes parts, farm surveys taken periodically and annual updated estimates based very heavily on SRS yield and price data.

Between 1974 and 1977, per acre costs for 10 major crops increased by 44 percent. Much of this increase occurred in 1975. Per acre costs in 1978 are projected to increase about 6 percent. Changes in per unit costs in 1978 could vary considerably. If trend yields occur in 1978, per unit costs will go up only slightly for wheat, rice, corn, barley, and soybeans. They would go down considerably for peanuts and would increase considerably for cotton, sorghum, oats, and flax.

AGRICULTURAL FINANCE: SITUATION AND ISSUES*

(By John E. Lee, Jr., Director, National Economic Analysis Division,
ERS, USDA)

During the next few minutes I would like to discuss the current financial situation of farmers and consider some issues that may impact on the financing of farm production during coming months. Dave Lins will follow with a discussion of the outlook for 1978.

First, the current situation

In general the current U.S. agricultural situation can be described as one in which (1) the equity position of most U.S. farmers remains strong; (2) the overall cash-flow position has deteriorated, and (3) changes in relative commodity prices have resulted in significantly different incomes and financial situations depending on the type of farm operation.

Farm indebtedness has increased rapidly during 1977 and will reach about \$119 billion by January 1, 1978. The estimated \$16 billion rise in outstanding debt seen in the past year will be a record by a sizable margin. Large increases in real estate loans by insurance companies are expected to increase those companies' share of all outstanding loans. Whether this represents a reversal of the downward trend for insurance company market shares or just a temporary pause due to general money market conditions remains to be seen.

Some shift in market shares has also occurred in non-real-estate debt. Revitalization of Government loan and storage programs has significantly increased CCC loan volume. Emergency loans for disaster assistance have increased the relative share of the Farmers Home Administration. Most of the increase in the market share of these two loan sources has come at the expense of commercial banks, in spite of an 11-percent increase in bank loan volume.

As illustrated in figure 1, the value of farm assets has risen rapidly since the early 1970's. This trend has continued throughout 1977 with the total asset value expected to rise 9 percent for the year. While debts have also been increasing rapidly and have taken a particularly large jump in 1977, they remain relatively small compared to total assets. Thus, proprietors' equities are high and continued to rise during 1977.

The broken line of figure 1 indicates what has happened to farm proprietors' equity since 1940. Although it was as low as 80 percent in the early 1940's and as high as 93 percent immediately following World War II, equity has hovered around 85 percent for the last

*Eddy LaDue, ESS, on leave from Cornell University, had major responsibility for preparation of the talk, with assistance from E. I. Reinsel, R. D. Reinsel, Carson Evans, Phil Allen, Steve Guebert, and Bruce Hottel.

TABLE 1.—OUTSTANDING FARM DEBT, JAN. 1

| Debt type and year | Total outstanding (billions) | Percentage of total | | | | |
|-------------------------|------------------------------------|---------------------|--------------------------------------|--------------------------------|--|------------------------|
| | | Commercial banks | Cooperative farm credit system | Life insurance companies | Farmers Home Administra- tion | Industry and others |
| Real estate debt: | | | | | | |
| 1950..... | \$12.1 | 12.6 | 19.3 | 23.3 | 5.6 | 39.1 |
| 1965..... | 18.9 | 12.8 | 19.5 | 22.7 | 6.8 | 38.2 |
| 1970..... | 29.2 | 12.1 | 22.9 | 19.6 | 7.8 | 37.5 |
| 1975..... | 46.3 | 12.9 | 29.0 | 13.6 | 6.9 | 37.6 |
| 1976..... | 51.1 | 12.3 | 31.2 | 13.2 | 6.6 | 36.7 |
| 1977..... | 56.6 | 12.0 | 32.6 | 13.1 | 6.5 | 35.8 |
| 1978 ¹ | 64.5 | 12.2 | 33.5 | 13.5 | 6.2 | 34.6 |
| CCC loans | | | | | | |
| Nonreal estate debt: | | | | | | |
| 1950..... | 12.7 | 38.0 | 11.4 | 9.2 | 3.1 | 38.3 |
| 1965..... | 17.9 | 39.0 | 13.4 | 8.6 | 3.6 | 35.3 |
| 1970..... | 23.8 | 43.3 | 19.8 | 11.2 | 3.3 | 22.4 |
| 1975..... | 35.5 | 51.3 | 27.8 | .9 | 2.9 | 17.0 |
| 1976..... | 39.8 | 50.7 | 28.0 | .9 | 4.5 | 16.0 |
| 1977..... | 46.1 | 50.5 | 27.4 | 2.2 | 4.1 | 15.8 |
| 1978 ¹ | 54.2 | 47.6 | 27.2 | 4.6 | 5.4 | 15.2 |

¹ Preliminary.

15 years. Even with the relatively low income experienced by many farmers in 1977, average farmer equity is only expected to decline to 84 percent, just 1 percentage point below that experienced during 1975 and 1976.

Most farmers have sufficient equity so that one or two poor income years will not cause widespread insolvency if the value of land and capital items remain near or above present levels. Although some decline in land values in certain areas is possible, current price supports should limit the magnitude of further price declines for the major crops. Through refinancing, renewals or extensions, most farmers will be able to remain in business and their financial position will continue sufficiently sound to protect lenders in most loans they make.

Reduced cash flow

The cash-flow position of U.S. farmers has deteriorated. Operators net cash income from farming for 1977 is expected to be at the lowest level since early in this decade. This decline in income can be expected to place some farmers in a cash-flow bind resulting in fewer cash capital purchases, limited principal repayment or reduced expenditures for family living. Coincident increases in living costs, capital goods prices and outstanding debt levels contribute to the severity of the situation.

Part of the impact of lower cash incomes is illustrated in figure 2. The solid line indicates relationship between beginning of year farm liabilities and annual net cash farm income. The liabilities represent the total outstanding farm debt at the beginning of the year. Net cash farm income is total cash income minus cash expenditures. Since the portion of capital investment that is made with cash rather than borrowed funds is difficult to estimate, the total value of all capital purchases are included in cash expenditures. Interest is also included as an expense. Although it provides an index of cash flow for comparison of year-to-year relationships, the net cash farm income used in these

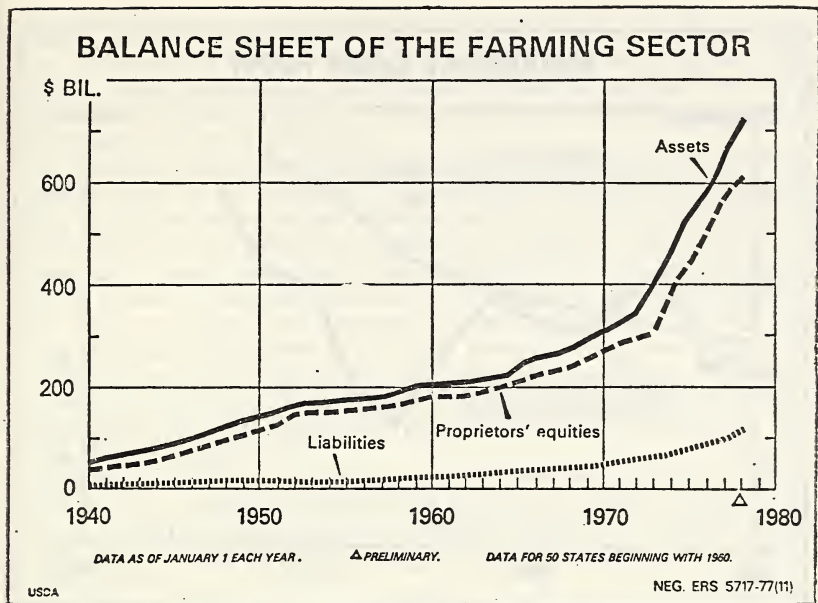


FIGURE 1.

calculations tends to underestimate cash flow somewhat. The understatement occurs because the value of capital purchased with borrowed funds is subtracted from cash receipts. Beyond this, these figures do not reflect the contributions of CCC loans to the cash-flow position of cash grain farmers.

The slightly over \$8 of debt that must be supported by each dollar of cash income for 1977 is one-third higher than it has been at any time since 1965. The previous high which occurred in 1967 was less than \$6.50; a value which was nearly equaled in 1976.

Also shown in figure 2 is an index of the cost of family living items. Living costs have been rising rapidly during the mid-1970's. This implies a continually increasing call on cash income for family living and results in a persistent decline in the proportion of each dollar of cash income that will be available for debt principal repayment.

The combined effect of the increased level of debt per dollar of cash income and increased living costs could be expected to result in an increased number of loan renewals, extensions and refinancing. And, this is what lenders are reporting. Recently conducted surveys of agricultural lenders indicate generally higher levels of refinancing and easing of credit terms for 1977 compared to 1976. Lenders expect more of the same in 1978.

At this point, something should be said about income to farm operator families from off-farm sources. In 1976, off-farm income is estimated to have been over \$30 billion, or substantially greater than net farm income. Moreover, this figure probably continues to move each year more in line with the general economy than with the farm econ-

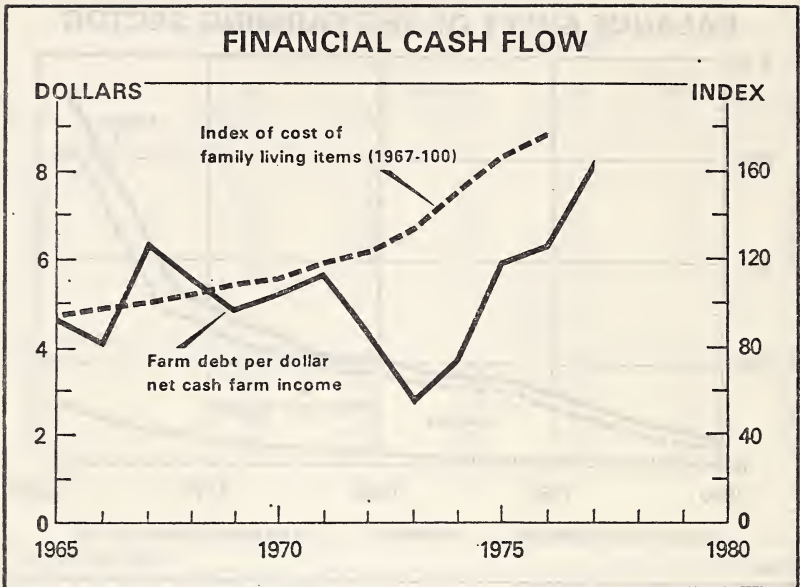


FIGURE 2.

omy. Obviously these income sources play a crucial role in the financial well-being of farm operator families and improve not only their debt repayment capacity but also their credit rating with lenders. We have some information about how these incomes are distributed by sales classes, but we don't know very precisely how the incidence of off-farm income matches the incidence of farm debt or about the quantitative importance of off-farm income in debt repayment or as a substitute for debt capital.

Type of farm differences

My discussion has focused on the aggregate agricultural situation. However, aggregate statistics, tell only part of the story. Commodity prices have not moved in unison. Some prices have dropped significantly, others have changed little and in some cases prices actually increased. These differences in commodity price movements have caused large differences in the financial position of various sectors of the farm economy.

For example, 1977 has been a good year for dairy farmers. Although many expenses were up, declining feed costs helped limit expense in total. More production combined with firm milk prices to increase total receipts. Thus, dairy farm cash flow was strong in 1977, and is expected to remain strong in 1978.

Swine and egg producers also experienced a relatively good year in 1977. Although cash receipts were down slightly from 1976 levels, net incomes were favorable and cash flows will permit most producers to enter 1978 in a strong financial position. Lower egg and pork prices will make 1978 a more difficult year and are likely to result in deteri-

orating cash flows and slower loan repayments as the year progresses. One advantage that these producers have is that both they and their lenders have experienced the ups and downs of normal production cycles and are more likely to be financially and mentally prepared for the changes that will take place.

The cattle industry is just completing its third year of relatively low or negative net earnings. Incomes are up slightly in 1977 over 1976, but the increases do not represent sufficient improvement to allow recovery from the cash-flow shortfalls of earlier years, nor even to make 1977 a good year from a cash-flow point of view. Despite the extended period of depressed financial conditions most cattlemen have been able to adjust their current debt obligations in line with cash flows through an increase in the time permitted for loan repayment.

Income, and thus cash flows, are expected to continue to improve in the cattle industry during 1978. Some additional restructuring of outstanding debt will likely be required, but most adjustments have already been made.

Financial conditions for fruit and nut products have been generally good in 1977. A larger production of apples and lemons has met ready markets. Slightly lower grape and orange crops were offset by higher prices. Net incomes in 1978 are expected to be similar to those experienced in 1977.

Gross income from vegetable production is expected to be higher in 1977 than 1976. The January freeze in the Florida fresh vegetable region caused significantly higher prices and improved incomes of some producers while inflicting heavy losses on others. This diversity will result in extreme variability in the financial positions among individual producers. Although these farmers are accustomed to weather induced income variability, lenders may observe that variations from producer-to-producer and year-to-year are greater than normal this year.

Wheat and feed grain producers have suffered the most serious declines in cash income. Market prices of these commodities have dropped sharply. Even with generally bumper crops, 1977 cash marketings of grain are expected to be 12 percent below 1976 levels. This drop follows a number of years of relatively favorable crop prices and price expectations producers apparently had built into their capital investment decisions during recent years.

The large supplies and expected heavy carryover will probably keep market prices near loan rates during 1978 and possibly beyond. This assessment depends heavily on developments around the world. But if present price prospects are realized, lower cash flows for 1977 and 1978 will force considerable financial adjustment for wheat and feed grain producers. Producers with livestock enterprises or experience with crops that have not declined in price can be expected to shift some resources to these other alternatives. In regions where off-farm work is a realistic alternative, participation in set-aside programs may allow some farmers to look more closely at off-farm job opportunities.

Financial structure adjustments of cash grain farms occurred at a rapid rate in 1977. Lenders report large increases in the number of loan renewals and extensions and have refinanced much short-term debt into long-term debt. More of these adjustments are expected in 1978. Without significant price increases, repayment periods for exist-

ing debt will have to be extended to match debt service requirements and cash flow.

Issues

I would now like to shift to a discussion of some issues which may be important in assessing both the current and near future financial prospects of farmers. To facilitate discussion I have divided the issues into two groups: those primarily influencing the supply of loan funds and those primarily influencing demand by farmers for those funds. My comments will be limited to a selected set of factors that warrant particular attention this year.

SUPPLY-RELATED ISSUES

CCC commodity loans are projected to expand sharply during 1977. Most of this expansion reflects increases in loans on wheat, corn, and cotton. Some additional loan activity for the 1977 crop can be expected in early 1978. Commodity loans have two general impacts on the farm credit market. First, commodity loans allow farmers to repay operating loans and make long-term debt payments earlier than would be possible if the lender had to wait until the crop was actually sold. This frees funds for other loans and helps borrowers maintain satisfactory credit ratings. Since the increased volume of these loans is concentrated in commodities that have experienced the largest price declines, the significance of their contribution to cash flows exceed their apparent importance as indicated by their relationship to total farm debt. Second, CCC loans provide a ready source of funds should farmers decide to hold increased inventories in hopes of higher commodity prices. Without CCC loans these funds would be requested from usual lenders.

The Commodity Credit Corp. stands ready, through ASCS, to supply storage facility loans of up to \$50,000 at 7 percent interest. Between April and October 1977, loan volume under this program was approximately \$160 million. Loan volume is expected to be over \$200 million by mid-1978. Although small relative to total farm debt this program represents a net addition to the supply of funds and could expand rapidly if demand materialized. The relatively low-interest rate should be attractive to farmers considering storage facility investment.

Deficiency payments

Wheat producers will soon receive an estimated \$0.9 billion in deficiency payments. In addition to easing the cash-flow burden for some of the farmers hardest hit by commodity price declines, these payments will increase the demand deposits of country banks. These payments represent about one-sixth of total producer receipts for wheat and will help forestall serious financial difficulties. The increased demand deposits should allow bankers to extend existing loans and will place them in a better position to assist farmers with spring planting needs.

Machinery manufacturer credit

Manufacturer shipments of farm machinery to dealers exceeded retail sales in both 1975 and 1976. Lower incomes for many grain pro-

ducers have had a negative impact on farm machinery sales again in 1977. For example, sales of 4-wheeled-drive tractors were down 24 percent for the first 9 months of 1977. The buildup of dealer inventories in 1976 and sluggish 1977 retail sales led manufacturers to increase available credit to encourage sales. Purchasers can frequently get zero interest credit for 6 months or more. Although manufacturers indicate that this program has been successful in reducing inventories, dealer lots are still well stocked.

During 1977 loan funds supplied by machinery manufacturers are forecast to increase about 25 percent. Manufacturers are expected to continue their finance-related merchandizing program in 1978 in an attempt to further reduce dealer inventories and bolster sales in what could be a year of soft demand.

The general economy

The course of the general economy could affect the supply of credit for agriculture. The generally higher money market rates that many forecast can be expected to reduce bank demand deposits, can draw some loan funds into low risk, relatively high yield Government securities, and reduce agricultural lending by banks and insurance companies in areas where State usury laws limit interest rates. As general interest rates increase, opportunities for bank depositors to increase returns by shifting funds from banks to Government and other higher return securities will improve. The resulting disintermediation or shifting of funds, particularly by large investors, could significantly reduce the supply of loanable funds. At the same time, bankers will face similar opportunities for investment of their funds. The temptation to invest in low-cost, safe, relatively high-interest rate Government securities will be great. Relatively high Federal funds rates could reduce the urgency to keep funds loaned out.

During 1977 the overall economy has had a generally positive effect on the level of funds available from commercial banks. Bankers report that funds have been about in balance with demand. Loans-to-deposit ratios are up somewhat but many bankers view this as desirable. Apparently, insufficient supply is a general problem only in the Northeast.

DEMAND ISSUES

On the demand side, factors that have historically been important determinants of the quantity of credit desired continue to be important. Farm enlargement and intergeneration transfer, and the coincident substitutions of debt for equity capital that is being withdrawn by those leaving agriculture, will continue. The rate of farm enlargement may lessen in the wheat and cash grain areas, but should remain important in many other areas. The demand for credit to replace depreciated basic machine items will continue. There are, however, a few demand related issues that merit special consideration.

Farm incomes

Farm incomes are down sharply in the wheat and cash grain areas, cotton incomes are below 1976 levels, and beef cattle producers and feeder incomes remain low. These lower incomes have several impacts

on demand or need for loanable funds. As income flows dwindle, farmers generally will tend to postpone farm enlargement and capital goods purchases other than essential items. If so, demand for intermediate and long-term loans will increase less rapidly than in recent years.

On the other hand, low incomes could increase demand for short-term funds as farmers turn to borrowing to finance operating expenses previously financed out of cash flow, or to refinance existing operating debt. Some short-term debt could also be converted to intermediate and longer term debt. These type arrangements will become more visible when farmers start making arrangements for financing next year's operating expenses.

Notwithstanding these potential impacts, the major impact of lower incomes may be the substitution of debt financing for the equity investment that would normally take place with higher incomes. Considerable investment is made each year from current net income. For example, replacement machines are often purchased from cash income. With lower incomes the amount of money available for these purchases declines sharply. Although some of these machines may not be replaced, considerable investment will be made. And an increased proportion of the capital used for these purchases will be debt capital.

Input prices

Prices of most items farmers buy are increasing. An important exception is the price of livestock feed which will be down significantly due to lower feed grain prices. Also, fertilizer prices may remain relatively constant. Lower feed prices reduce the need for loanable funds, other things being equal. But in the present situation, lower feed prices will likely restore cattle feeders' optimism, resulting in significant increases in feeding activity and increased demand for short-term loans to finance the feeding. Higher prices of capital goods and other items farmers buy will tend to increase credit demand. The net effect of recent and near-term prices will be an upward push on the demand for loan funds.

Condition of the current capital stock

During recent years of relatively high prices for wheat and feed grains, farmers made large investments in machinery and buildings. Machinery investment was, at times, so high that strain was placed on manufacturers' production capacity. This activity has led to development of a farm capital stock that is in generally good condition. Producers will, therefore, feel less urgency to buy new machinery and building items.

Set-aside program

The Department has announced a 20 percent set-aside for the 1978 wheat crop. This means that wheat farmers must put an acreage equivalent to 20 percent of their wheat acreage in conserving uses to be eligible for program benefits. Analysts expect this to result in 12 to 15 percent fewer acres of wheat next year. The reduced acreage could reduce input use (perhaps by slightly less than the acreage reduction) and operating expenses, and thus demand for operating loans. Because

these programs remove some land from production on each farm and do not remove whole farms, the main impact on machinery demand will likely be less need to trade up to larger sizes.

At the time of this writing, no decision had been made on set-aside for feed grains. To the extent that relative prices induce a shift of corn acreage to soybeans, a crop with lower input requirements, overall demand for production inputs and operating loans will be dampened.

SUMMARY

Agriculture has a high level of equity and, in that respect, remains in a strong financial position. However, the net cash flow of agriculture is down and the level of debt per dollar of net cash flow is the highest it has been in recent history. Considerable variability in the financial situation exists among types of farms. Beef producers suffered their third year of low and negative incomes and thus additional financial adjustments were required. However, most of the dramatic adjustments have taken place. Wheat and feed grains producers suffered a large reduction in cash flow that will result in many adjustments and significant restructuring of debt. CCC loans, however, should help them overcome many of these difficulties.

The net result of forces impacting on supply and demand of loanable funds would appear to leave demand strong but somewhat dampened from recent highs and supply also somewhat lower but adequate to meet needs. These forces also suggest a continued rise in farm debt in 1978 but at a slower pace than in 1977.

POSTSCRIPT

The changing financial and income structure of the farm production sector makes the sector much more sensitive to instability of prices paid and received and to fluctuations in gross receipts and production expenses. Some of the changing financial structure is related to the increasing dependence on purchased inputs. As a result, net farm income as a proportion of gross receipts (table 2) has declined from the 50-percent range early in this century, to the 30- to 40-percent range in the forties and the steady decline since then, dropping below 20 percent in 1977.

Thus, in 1950 a 5-percent variation in commodity prices would have caused a 12- to 13-percent variation in realized net farm income, other things held constant. In 1977, a 5-percent variation in commodity prices would cause an approximate 25 percent variation in realized net. Likewise, in 1950 a 5-percent increase in production expenses would have caused an 8- to 9-percent decrease in realized net farm income. Today, the impact of the same percentage increase in production expenses would cause a 20- to 22-percent drop in realized net.

The leverage implied in the above examples raises questions about the implications of potential income instability for: The financial health of the farm sector; incentives for capital investment; and attitudes and optimal management strategies for both lenders and borrowers. This income-credit relationship and its implications deserve far more thought and scrutiny than it has received.

TABLE 2.—REALIZED GROSS AND NET INCOME FROM FARMING, SELECTED YEARS

[Dollar amounts in billions]

| Year | Including Government payments | | | |
|---------------|----------------------------------|------------------------|---------------------|---|
| | Realized gross farm income | Production expenses | Realized net income | |
| | | | Amount | Percent of realized gross income |
| 1910-14 | \$7.6 | \$3.7 | \$3.8 | 50.4 |
| 1915-19 | 13.1 | 6.1 | 6.9 | 53.0 |
| 1920-24 | 12.5 | 7.3 | 5.1 | 41.5 |
| 1925-29 | 13.5 | 7.5 | 6.0 | 44.6 |
| 1930-34 | 8.3 | 5.2 | 3.1 | 38.0 |
| 1945 | 25.8 | 13.0 | 12.7 | 49.4 |
| 1950 | 32.2 | 19.4 | 12.8 | 39.8 |
| 1955 | 33.2 | 22.1 | 11.0 | 33.3 |
| 1960 | 38.4 | 27.3 | 11.1 | 28.9 |
| 1965 | 45.5 | 33.6 | 11.8 | 26.1 |
| 1970 | 58.5 | 44.4 | 14.1 | 24.2 |
| 1975 | 96.6 | 75.8 | 20.8 | 21.5 |
| 1976 | 103.6 | 81.7 | 21.9 | 21.1 |
| 1977 | 105.5 | 85.5 | 20.0 | 19.0 |

CREDIT AND FINANCE OUTLOOK

(By David Lins, Agricultural Economist, National Economic Analysis Division,
ERS, USDA)

Previous discussion by John Lee focused on the current credit situation and some of the key issues faced by those concerned with the financing of farm production. In my remarks, I will give some projection estimates of the financial outcomes in the farm production sector for 1978. In addition, I will review the implications of these projection estimates as they relate to farm operators, farm lenders, farm input suppliers, and consumers.

The quantitative estimates reported here have been developed with the aid of a simulation model of the farm production sector. In running this model, we start with preliminary January 1, 1978 balance sheet estimates provided by ERS experts. We then take these estimates of indexes of prices received and paid for 1978 and generate a projected balance sheet, income statement, and cash flow statement for 1978. It should be recognized that the projection estimates are for the entire United States and substantial differences by region are likely to exist.

PROJECTED CASH SOURCES AND USES OF FUNDS FOR 1978

Total net cash sources of funds for 1978 are projected to total \$79.7 billion, virtually unchanged from the preliminary estimate for 1977 (table 1). Some increase in off-farm income is expected, while net cash farm income is projected to decline slightly. Reductions in net cash income in 1978 appear more likely to occur on cash grain farms rather than on farms concentrating on livestock production. If one deflates cash income projected for 1978 to get real dollar flows, then real net cash income in 1978 is projected to be more than 4 percent lower than in 1977, and more than 25 percent lower than 1973.

Net increases in debt are expected to account for 18 percent of the net cash flow of funds. While this percent is about equal to 1977, the importance of borrowed funds has increased substantially in recent years. There is also increasing concern whether the income of farm operators can support the debt load. A proxy measure of the relative burden of debt is given by the ratio of debt outstanding to total net cash income (figure 1). This ratio has increased tremendously in recent years and reflects the fact that increases in debt have far outpaced increases in income.

(171)

TABLE 1.—CASH SOURCES AND USES OF FUNDS FOR THE U.S. FARM SECTOR, 1968-78

| Line | Item | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 ¹ | 1978 ² |
|--|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------|-------------------|
| Cash sources of funds (billions):³ | | | | | | | | | | | | |
| 1 | Net cash income from farm and nonfarm sources | \$33.1 | \$36.5 | \$37.5 | \$38.7 | \$46.8 | \$64.9 | \$64.9 | \$64.6 | \$64.9 | \$65.2 | \$65.6 |
| 2 | Net flow of real estate loans | 2.3 | 1.8 | 1.1 | 1.9 | 3.5 | 5.6 | 5.0 | 4.8 | 5.3 | 7.9 | 8.4 |
| 3 | Net flow of nonreal estate loans ⁴ | -5 | .7 | 1.1 | 2.4 | 3.2 | 4.3 | 3.1 | 4.2 | 5.7 | 6.6 | 5.9 |
| 4 | Total, cash sources of funds ⁵ | 34.9 | 39.0 | 39.7 | 43.0 | 53.5 | 74.8 | 73.0 | 73.6 | 75.9 | 79.7 | 79.9 |
| Cash uses of funds (billions):³ | | | | | | | | | | | | |
| 5 | Purchases of machinery and motor vehicles | 4.6 | 4.5 | 4.9 | 4.9 | 5.7 | 7.6 | 8.2 | 8.8 | 9.6 | 10.1 | 10.8 |
| 6 | Capital improvement to real estate assets | 2.1 | 2.3 | 2.4 | 2.5 | 2.4 | 3.1 | 4.4 | 4.3 | 5.0 | 5.1 | 5.2 |
| 7 | Other capital purchases ⁶ | 1.6 | 1.2 | 1.5 | 2.5 | 3.1 | 2.4 | 1.0 | 1.2 | 1.2 | 1.4 | 1.6 |
| 8 | Annual capital formation | 8.3 | 8.0 | 8.8 | 9.9 | 11.2 | 13.1 | 13.6 | 14.3 | 15.8 | 16.6 | 17.6 |
| 9 | Purchases of real estate from discontinuing proprietors | 4.3 | 4.3 | 4.1 | 5.8 | 8.5 | 11.4 | 9.5 | 9.8 | 11.2 | 12.6 | 14.1 |
| 10 | Total, purchased capital | 12.6 | 12.3 | 12.9 | 15.7 | 19.7 | 24.5 | 23.1 | 24.1 | 27.0 | 29.2 | 31.7 |
| 11 | Personal consumption and other cash uses | 22.3 | 26.7 | 26.8 | 27.3 | 33.8 | 50.3 | 49.9 | 49.5 | 48.9 | 50.5 | 48.2 |
| 12 | Total, cash uses of funds | 34.9 | 39.0 | 39.7 | 43.0 | 53.5 | 74.8 | 73.0 | 73.6 | 75.9 | 79.7 | 79.9 |
| Capital flows (billions): | | | | | | | | | | | | |
| 13 | Total purchased capital | 12.6 | 12.3 | 12.9 | 15.7 | 19.7 | 24.5 | 23.1 | 24.1 | 27.0 | 29.2 | 31.7 |
| 14 | Change in inventories | .1 | .1 | 0 | 1.9 | .9 | 3.4 | -1.6 | 3.4 | -1.9 | -2 | 1.4 |
| 15 | Total, capital flow | 12.7 | 12.4 | 12.9 | 17.1 | 20.6 | 27.9 | 21.5 | 27.5 | 25.1 | 29.0 | 33.1 |
| 16 | Real dollar flows (billions): | 27.0 | 28.5 | 27.8 | 27.3 | 32.1 | 41.5 | 38.1 | 34.9 | 33.2 | 31.4 | 30.0 |
| 17 | Net cash income from farm and nonfarm sources/GNP deflator (58=100) | 18.2 | 20.8 | 19.8 | 19.3 | 23.2 | 32.2 | 29.3 | 26.7 | 25.1 | 24.4 | 22.1 |
| | Personal consumption and other, cash uses/GNP deflator (58=100) | | | | | | | | | | | |
| Analytical ratios (percent): | | | | | | | | | | | | |
| 18 | Total purchased capital/total net cash income (10÷1) | 38 | 34 | 34 | 41 | 42 | 38 | 36 | 37 | 42 | 45 | 48 |
| 19 | Total net flow of loans/total purchased capital ((2+3)÷10) | 14 | 20 | 17 | 27 | 34 | 40 | 35 | 37 | 41 | 50 | 43 |
| 20 | Total net flow of loans/total capital flow ((2+3)÷15) | 14 | 20 | 17 | 25 | 33 | 35 | 38 | 33 | 44 | 50 | 43 |
| 21 | Net flow of real estate loans/total cash uses (2÷12) | 7 | 5 | 3 | 4 | 7 | 7 | 7 | 7 | 7 | 10 | 11 |
| 22 | Net flow of nonreal estate loans/total cash uses (3÷12) | -1 | 2 | 3 | 6 | 6 | 6 | 4 | 6 | 7 | 7 | 8 |
| 23 | Cash income/total cash uses (1÷12) | 94 | 93 | 94 | 90 | 87 | 87 | 89 | 87 | 86 | 82 | 82 |
| 24 | Debt outstanding/total net cash income | 143 | 138 | 141 | 141 | 125 | 101 | 114 | 127 | 140 | 157 | 187 |

¹ Preliminary.² Forecast by farm sector simulation model.³ Cash sources of funds from sale of real estate to the nonfarm sector are not included due to the lack of data.⁴ Does not include CCC loans.

⁵ Gross cash farm operating expenses have been deducted from gross cash farm income.

⁶ Included, net additions to household furnishings, commercial bank deposits and currency, and purchases of breeding livestock. Purchases of breeding livestock are estimated as a percentage of total expenditures for the purchase of livestock. Census benchmark data are used to estimate the percentage values.

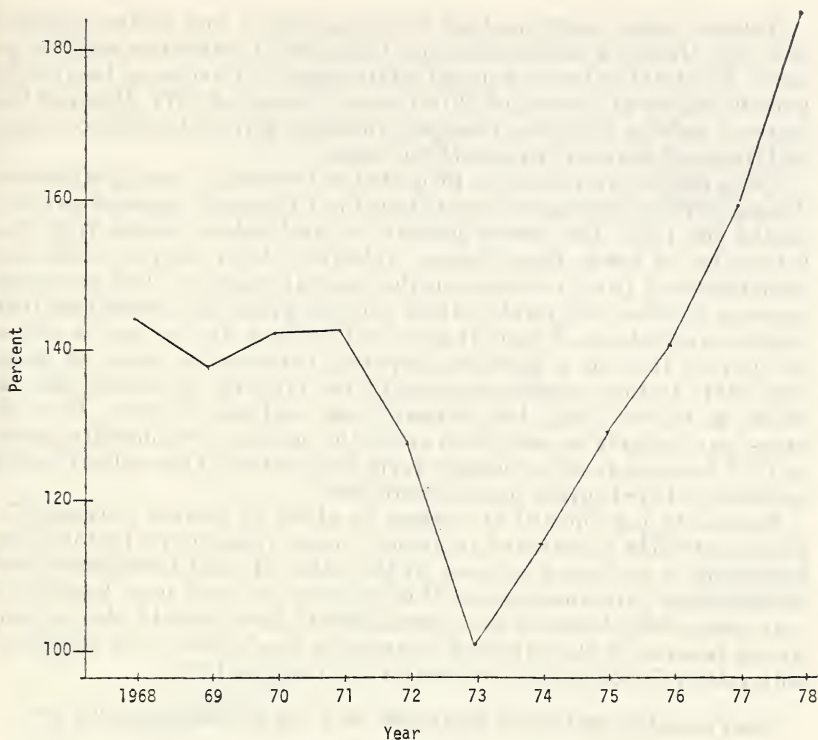


FIGURE 1.—Debt outstanding as a percent of net cash income from farm and nonfarm sources

Annual capital formation for 1978 is forecast at \$17.6 billion, a small increase over 1977. If one deflates the capital expenditures by the prices paid, then real capital expenditures during 1978 should about equal expenditures during 1977. Purchases of real estate assets from discontinuing proprietors are forecast to total \$14.1 billion during 1978. This represents an increase of 11 percent over preliminary estimates for 1977. The increase reflects in part the projection of an increase in the rate of real estate transfers.

Personal consumption and other cash uses of funds are forecast to total \$48.2 billion during 1978. Both in current and real dollars this reflects a drop from 1977.

THE PROJECTED BALANCE SHEET, JANUARY 1, 1979

The projected value of farm assets as of January 1, 1979 is forecast at \$782.4 billion (table 2). This would be an increase of 7.2 percent for 1978. As in other recent years, most of the increase in value is attributable to unrealized capital gains since the value of assets in 1967 prices is projected to remain virtually unchanged.

Financial assets are expected to grow by roughly 4 percent during 1978. But in terms of the real purchasing power, a decline is expected. This decline can be attributed to estimated reductions in real income of farm operators during 1978.

Nonreal estate assets include farm machinery and motor vehicles, crop and livestock inventories, and household furnishings and equipment. The total value of nonreal estate assets is forecast to be over 12 percent higher at the end of 1978 than at the end of 1977. Much of the increase reflects valuation changes, although physical stocks of crops and livestock are also projected to increase.

Farm real estate values are projected to increase by nearly 6 percent during 1978, a substantial drop from the 10 percent increase now expected for 1977. The slower growth in land values results from the projection of lower farm income, relatively high interest rates and moderation of price increases in the general economy. The projected increase in farm real estate values is based upon the assumption that buyers' expectations of capital gains will remain strong. But as shown in figure 2 there is a growing disparity between the value of farm real estate and the income generated from farming. Questions may be raised as to how long that disparity can continue to grow. In some areas, particularly in cash grain areas, the decline in commodity prices in 1977 has led to reductions in farm land values. This pattern could continue in 1978 if grain prices remain low.

Farm debt is projected to increase by about 12 percent during 1978. Real estate debt is expected to grow by more than nonreal estate debt because of a projected increase in the value of land transferred and because some farm operators will be refinancing short-term loans with real estate debt. Demand for nonreal estate loans should also remain strong because of the expected increase in production costs combined with relatively low prices received on farm commodities.

TABLE 2.—BALANCE SHEET FOR THE FARM SECTOR, JAN. 1, 1978 AND FORECAST TO JAN. 1, 1979

[Dollar amounts in billions]

| Item | Current values | | Values in 1967 prices | | 1978 to 1979 percent change with— | |
|--|---------------------------|---------------------------|---------------------------|---------------------------|-----------------------------------|------------------------------------|
| | Jan. 1, 1978 ¹ | Jan. 1, 1979 ² | Jan. 1, 1978 ¹ | Jan. 1, 1979 ² | Current values ¹ | Values in 1967 prices ² |
| Physical assets: | | | | | | |
| Real estate assets..... | \$546.9 | \$579.4 | \$198.5 | \$198.7 | 5.9 | 0.1 |
| Nonreal estate assets ³ | 148.0 | 167.0 | 74.1 | 75.7 | 12.8 | 2.2 |
| Total, physical assets..... | 694.9 | 764.4 | 272.6 | 274.4 | 7.4 | .7 |
| Financial assets: | | | | | | |
| Commercial bank deposits and currency..... | 16.4 | 17.0 | 7.9 | 7.8 | 3.7 | -1.3 |
| Other financial assets ⁴ | 18.3 | 19.0 | 9.0 | 8.7 | 3.8 | -3.3 |
| Total, financial assets..... | 34.7 | 36.0 | 16.9 | 16.5 | 3.7 | -2.4 |
| Total, farm assets..... | 729.6 | 782.4 | 289.5 | 290.9 | 7.2 | .5 |
| Debt claims: | | | | | | |
| Real estate debt..... | 64.5 | 72.9 | | | 13.0 | |
| Nonreal estate debt including CCC loans..... | 54.2 | 60.1 | | | 10.9 | |
| Total debt..... | 118.7 | 133.0 | | | 12.0 | |
| Equity..... | 610.9 | 649.4 | | | 6.3 | |
| Percent: | | | | | | |
| Debt to asset ratio..... | 16.3 | 17.0 | | | 4.3 | |
| Debt to equity ratio..... | 19.4 | 20.4 | | | 5.2 | |

¹ Preliminary estimate.² Forecast by the AIW simulator.³ Includes machinery and motor vehicles, household furnishings and equipment and inventories of crops (including crops held as security for CCC loans) and livestock.⁴ Includes U.S. savings bonds and investments in farmer cooperatives. Does not include financial claims on specific nonfarm assets such as holding of common stock as data on these claims are not available.

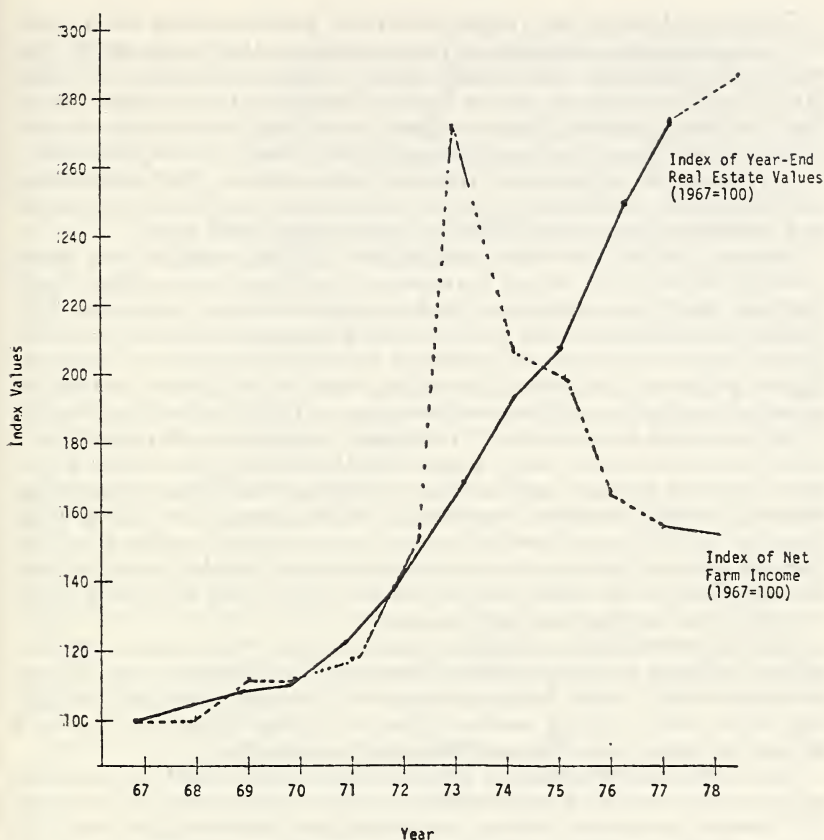


FIGURE 2.—Trends in land values and net farm income

An increase of \$38.5 billion in the equity of farm proprietors is forecast for 1978. But if one deflates the January 1, 1979 value to measure real purchasing power, then proprietor's equities in real terms are expected to be about the same at the start of 1979 as at the start of 1978.

IMPLICATIONS OF PROJECTION ESTIMATES

For farm lenders

Projection estimates for 1978 portend more difficult times for a number of lenders serving agriculture. Repayment ability of farm borrowers will be reduced because of low farm income. Difficulties will most often arise with young operators who are highly leveraged and have few financial reserves. Delinquencies among such borrowers are expected to rise. More established farm borrowers have gained considerable equity in land, but may still have cash flow problems. In these cases, lenders may be asked to restructure debt. That is, farm operators may want to mortgage land to obtain funds to meet payment schedules on short and intermediate loans or to finance operating expenses.

Commercial banks may experience more problems than other lenders in meeting loan demands of farm operators. Going into 1978, loan to deposit ratios for rural banks in some regions were at an all-time high. Further increases in the loan to deposit ratio for these banks does not seem feasible. Hence, expansion of loan volume may be curtailed since deposits in rural banks are not likely to keep pace with loan demand in a period of reduced farm income. Well established operators will continue to be served, but more marginal operators or new borrowers may have difficulty in obtaining bank loans.

Because production credit associations (PCA's) acquire loan funds through the national money markets, no problems in acquiring funds for agriculture are anticipated. But like other lenders, repayment difficulties of their borrowers will be more pronounced than in previous years. Many borrowers will attempt to hold inventories in hopes of higher prices in the future. Providing the financing for the holding of such inventories will be a real concern to PCA's and other lenders.

Federal land banks and life insurance companies will experience a high demand for real estate loans. While obtaining the funds necessary for such loans should not be a problem, the income generating capacity of the borrowers may be cause for concern. Net income from farming in 1978 is projected to be about equal to that obtained in 1972. Yet the price of farm real estate has more than doubled over the same period. Clearly, the ability to pay current prices for farm real estate out of farm earnings has been reduced.

The Farmers Home Administration will likely experience a greater volume of loan requests in 1978. Because of low income and poor repayment ability, more farm operators will be unable to obtain financing from other lending sources. Many of these borrowers may seek financing through the Farmers Home Administration.

One of the uncertainties in 1978 for farm lenders will be the dollar volume of crops placed under CCC loan. Loan funds provided through CCC could reduce the demand for operating loans from other sources such as banks and PCA's. Market prices relative to support rates are, of course, an important determinant of the demand for CCC loans. If market prices are about equal to or below support rates, loan volume could be high. Current expectations are that market prices may be about equal to support rates. Consequently, the volume of CCC loans is expected to be high in 1978 and this will tend to moderate an already high demand for nonreal estate loans from banks and PCA's.

For farm operators

The projection estimates suggest that farm operators will experience a reduction in net farm income in 1978 over 1977. In real dollar terms, the expected decline from the previous four years suggests that purchases of personal consumption items will need to be trimmed. The importance of nonfarm income is becoming more pronounced and these sources of income will need to be maintained or expanded in 1978.

The projected reduction in farm income means that more farm operators will have problems repaying their debts, financing new acquisitions, and meeting operating expenses. Repayment difficulties seem likely, especially for those operators who are highly leveraged

and produce commodities hardest hit by price reductions. In some case, these operators may need to search for new lending sources.

For more established farm operators who have considerable equity in real estate, loan repayment difficulties may still arise. High equity in real estate is no guarantee of sufficient cash flows necessary to meet consumption needs and repay debts. Farm operators in this category will likely continue to be financed by their regular lending source. However, the lender may demand more security and may more closely scrutinize the income generating potential of new investments. In cases where loan repayment difficulties are severe, lenders may suggest long-term debt repayment plans.

In considering capital expansions, farm operators will need to carefully evaluate the income potential of such investments. Grain storage facilities are expected to be one of the more favorable investment alternatives available. In some cases, machine sheds, barns, garages, and other structures may be converted to temporary storage locations. Investments in new tractors and other farm implements may be postponed by a sizable number of operators.

Purchases of farm real estate to expand farming operations are becoming more and more difficult for many farm operators. In many cases the price of land cannot be justified solely by the income generating potential of the land. Rather expected capital gains on land have become a more important part of the price paid for land. But capital gains on land do not generate cash necessary to meet loan commitments. Consequently, the purchase of land can be most easily handled by individuals or institutions with large financial reserves or with substantial income from nonfarm sources. Young farm operators seldom meet these criteria.

Outside equity capital sources, such as mutual funds or foreign investors do meet these criteria. These investors are seeking investments with strong capital gains potential, and the rate of inflation of farm land in recent years has far exceeded the rate of inflation in the general economy. Consequently, interest in farm land by outside equity capital sources should remain strong in 1978.

The growing disparity between the price of farm real estate and farm income should be a source of concern to all farm operators who recently purchased land or those who plan to purchase in the near future. The concern is whether capital gains on land will remain strong in the face of current farm income trends. As long as buyers expect land values to increase and as long as there are adequate sources of income generated on other assets, land values should continue to rise. But if expectations of capital gains are reduced or reversed, a decline in land values would likely follow.

For farm input suppliers

The implications of farm finance projection estimates for input suppliers vary substantially from one supplier to another. Farm demand for major capital items will likely be reduced because of low farm income. Machinery manufacturers and dealers may find it necessary to offer delayed payment and easy credit terms to promote the sales of their products. Suppliers of production inputs such as seed, chemicals and fuels may experience small reductions in demand for their products as a result of Government set-aside programs. More im-

portantly, there may be an increasing tendency for farm operators to delay payments on open accounts.

Input suppliers, particularly those furnishing operating items, will be faced with increasing concerns over accounts receivable. Increases in open accounts may appear to be an attractive alternative for farm operators who face a liquidity problem and cannot obtain adequate financing from the traditional lending sources.

Contrary to most input suppliers, grain storage manufacturers and suppliers should experience strong demand for their products in 1978. Many farm operators want to hold grains in hopes of better prices. In addition, Government loan programs for the construction of grain storage facilities should provide further impetus to an already strong demand.

For consumers

The projection estimates outlined earlier have several implications for consumers. Projected prices of farm commodities suggest that increases in food prices should be moderate. Increases in food prices that do arise are more likely to be caused by increasing costs in the food processing and distribution sector than by increases in commodity prices at the farm level.

Moderation in food price increases, however, is not without cost to consumers. As a part of the tax paying public, consumers must help pay the costs of Government support payments to farmers. Support payments to farmers, however, are a very small fraction of the Federal budget. The value of stability in food prices needs to be weighed against the cost of support programs.

FARM FINANCE—CURRENT DEVELOPMENTS IN PERSPECTIVE

(By Emanuel Melichar, Senior Economist, Division of Research and Statistics, Board of Governors of the Federal Reserve System¹)

As described in the preceding papers by John Lee and David Lins, a rise in farm debt (excluding CCC loans) of \$11 billion, or 12 percent, in 1976 is being followed this year by a further increase of about \$15 billion, or 14 percent. A glance at the record of the past four decades is sufficient to establish that increases of the magnitude of 14 percent in a single year have been more characteristic of experience during farm boom years such as 1950–51 and 1973, rather than of a period such as 1977 in which farm income is relatively depressed and has few prospects for significant near-term improvement. As a result, key financial relationships examined in this paper now exhibit unusual and worrisome levels. As confirmed by reports from the most vulnerable farm lender group—rural commercial banks—the farming sector has entered a difficult financial period.

In assessing current farm financial developments, a longer term perspective is at once both highly useful and of limited usefulness. It is useful in establishing that the sector has just gone through a major boom in capital expenditures and land prices that involved a relatively high level of debt financing. Such experience in any sector is followed by financial shocks if income flows fall significantly from the levels that triggered and fed the boom. For the farming sector, however, the longer term perspective fails to provide an adequately relevant comparison with similar previous episodes and their aftermath. Such periods in this century are few in number as well as strongly affected by special circumstances. The prolonged farm boom spanning World War II, the Marshall plan, and the Korean War was atypical in its lack of significant debt financing and in the highly liquid state of both farmers and rural banks at its conclusion. A small boom in the mid-1960's was too minor to provide useful analytical precedents for present experience. Recent farm income and other financial experience has been remarkably similar to the farm boom of World War I, but the financial agony following that boom is today of limited relevance—except perhaps to indicate what could occur in the absence of Government farm income and credit programs and other financial innovations such as insurance of bank deposits and amortization of farm mortgage loans. Our longer term perspective will not, therefore, provide a guide to probable future experience in the sense, for instance, that business analysts expect from a study of reference cycles. But it

¹The analyses and conclusions presented are solely those of the author and do not necessarily reflect the views of the Board of Governors or other members of its staff.

will lead one to appreciate that the current situation is highly unusual and potentially troublesome.

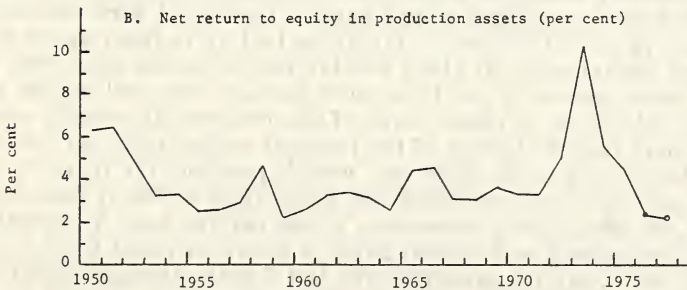
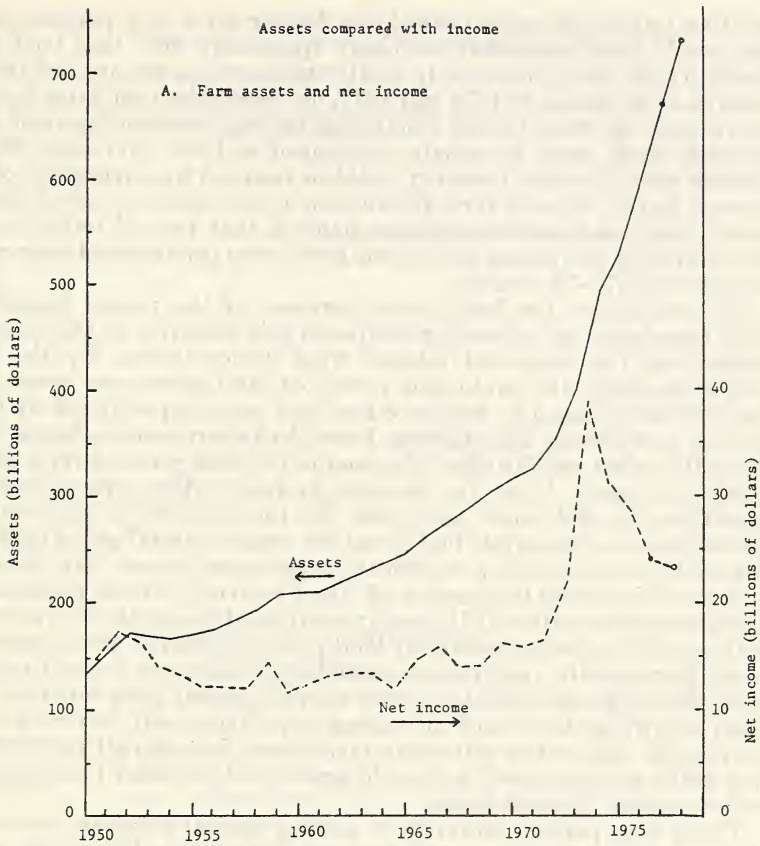
The charts that accompany this paper each show annual data extending back to 1950. The changing fortunes of farming over this period are reflected in the swings displayed by net farm income, shown in panel A of chart 1. The early 1950's were the concluding years of the World War II—Korean War boom, and were followed by a "cost-price squeeze" on net income during the remainder of the decade. Net income trended gradually upward during the 1960's, rose sharply in 1972 and 1973, and then began a decline that is now in its fourth year. The last value plotted for this series (and for other flow series in this set of charts) is a projection for 1977.

As also indicated in panel A of the chart, the value of farm assets rose during most years since 1950 (the last value plotted is a projection for year-end 1977). Most of the total rise has reflected increases in asset prices—particularly increases in land prices—as net investment has been relatively minor and since 1954 there has also been a net decrease in the amount of land devoted to farming. The rise in land prices in the 1950's increased farm equity and helped to drive the annual return from production to around 3 percent of equity, as shown in panel B of chart 1. Continued land price increases kept the return at about this level during the 1960's and early 1970's. In 1972, the rise in land prices accelerated in response to the sharp increase in the profitability of farming. After 1973, land prices continued to rise in the face of declining net income, and by 1976 the return to equity was driven down to 2.4 percent. If, as John Lee has just estimated, land prices rose by another 10 percent in 1977, then the net return to equity this year has fallen further to about 2.1 percent.

From the mid-1950's to the early 1970's, the net return to farm equity fluctuated narrowly around 3 percent, a performance that drew considerable comment. In the early years of this period, it was thought paradoxical that land prices were rising when the return was already somewhat below that available on many other investments. As the 3 percent rate of return persisted, however, analysts perceived it as an equilibrium level. As total returns to equity trended upward, land prices were being bid up by just enough to keep the relative return at about 3 percent. Reinsel in 1973 noted that this process was highly visible in the case of rental farmland in stable agricultural areas. He showed that as cash rents trended upward, land prices responded in proportion, keeping relative net rental returns remarkably constant over this period. Parenthetically, as Reinsel has also pointed out, the problem with studies concluding that land price trends were unrelated to total net farm income over this period is that they are looking at the wrong income flow.

In the mid-1960's, therefore, analysts turned, in effect, to examination of the origins of the increasing net return to equity. The most powerful influence was the combination of decreasing unit costs of production (resulting from technological advances) and constant, supported, output prices. Another influence noted was that farmers able to achieve above average relative returns were buying land from farmers less skilled or fortunate.

The large land price increases of 1972-75 are readily explained by the sharp rise in relative returns. Clearly, if one had assumed a continuation of returns experienced in that period and a tendency for



Note: Net income shown is farm operators' total net income from farming (USDA series, including government payments) plus net rent received by nonoperator landlords.

Net return to equity is net income from farm production minus returns imputed to labor and management (USDA series, The Balance Sheet of the Farming Sector).

CHART 1

relative returns to move toward the former level of 3 percent, then one would have concluded—as many apparently did—that land was underpriced. Now, however, if similar assumptions are applied to the returns experienced in 1976 and 1977, one concludes that farm land is overpriced. If other things (including income, outstanding debt and interest rates) were to remain unchanged at their 1977 level, the 3 percent rate of return to equity could be restored by a reduction of 31 percent in the value of farm production assets. Alternatively, holding assets, debt, and interest rates unchanged, that rate of return could be restored by increasing net income from farm production to approximately the 1973–75 average.

To summarize, the land price increases of the period preceding 1972 were based on increasing returns to this resource, and the factors underlying the improved returns were demonstrated. By the late 1960's, however, the prolonged period of land price rises seemed in itself to have begun to influence the land price expectations of land market participants and analysts. Panel A of chart 2 shows data underlying this effect on attitudes. The nominal capital gains on farm assets plotted in panel A are the increase in asset values minus such net investment as did occur each year. By the late 1960's, land market participants and analysts had noted the steady capital gains that appeared to be providing a significant supplement to net farm income, and were discussing the concept of "total returns" to farm investment. Their experience after 1971 greatly reinforced this outlook. The carefully established relationship of land prices to returns was ignored in much purportedly analytical commentary, which was instead replete with short-cut references to factors such as general price inflation, the fixed supply of land, and increasing population—all factors with a bearing on the level of returns to farm assets, but also all factors that had in the past coexisted, and could again, with periods of declining as well as advancing land prices.

Those who persist, however, in adding capital gains to income to obtain a "total return" to the farming sector should note that only the amount by which the appreciation of farm equity exceeds general price inflation represents a real gain to owners of farm assets. For example, if, as in 1977, each \$100 billion tied up in farm equity yields nominal capital gains of about \$10 billion, but in the same year consumer prices generally rise by about 6 percent, then real capital gains are only \$4 billion. In other words, if the owners of this equity were to spend more than \$4 billion of the nominal capital gains on consumption, they would erode their real wealth position. Or if, as in 1974, prices paid by farm consumers rise faster than prices of farm assets, owners of farm equity experience a real capital loss. A comparison of net income and real capital gains is shown in panel B of chart 2. In real terms, capital gains over the last 5 years average slightly less than income, rather than overshadowing income as one might suppose after viewing nominal gains only. Also note that real capital gains disappeared in 1968–70, providing a recent example of a period in which farm assets did not appreciate faster than the rate of general price inflation.

Finally, in any comparisons over time, both income and real capital gains should be viewed in dollars of constant farm consumer purchasing power, as is done in panel C of chart 2. In constant dollars the recent levels of income and capital gains are revealed as somewhat

Three views of farm net income and capital gains

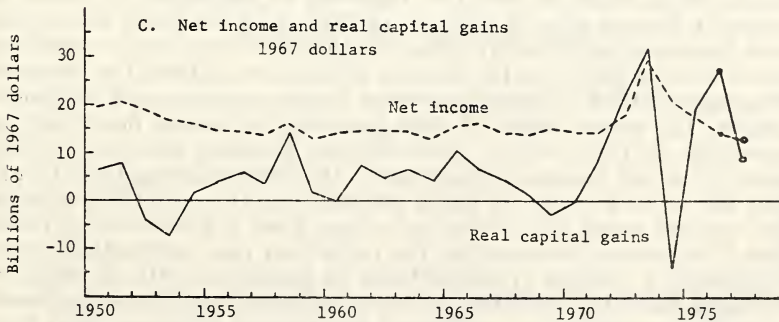
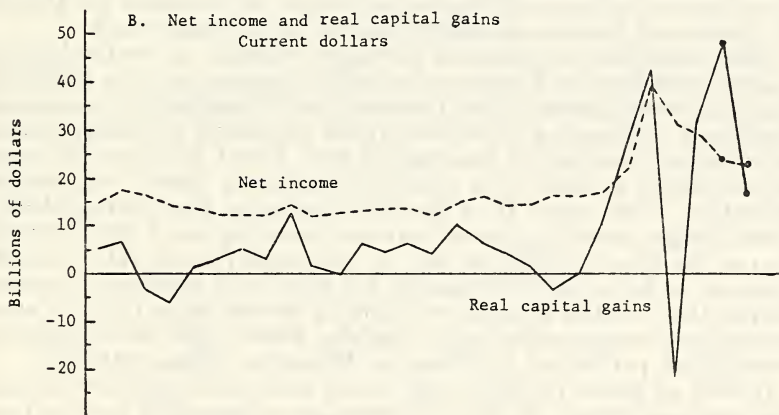
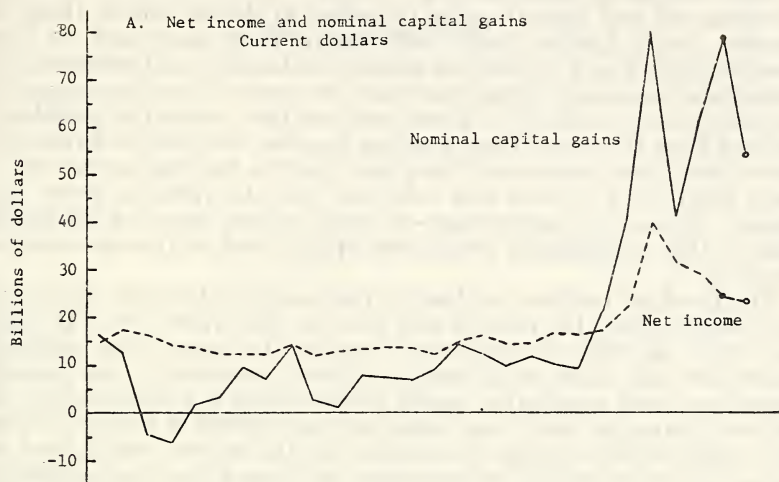


CHART 2

more modest relative to past levels. Income, in fact, has dropped below its pre-1972 level.

With returns to farm assets now relatively depressed and the continuation of real capital gains therefore in doubt, should there be concern about further large increases in farm debt such as that occurring this year? In both the popular and analytical literature, this question is commonly being examined in terms of relationships such as those shown in chart 3. These analyses thus exude the confidence derived from the recent large absolute increase in equity and from the low over-all debt/asset ratio. They note that the farming sector's debt/asset ratio is 16 percent and conclude that the farming sector can greatly increase its borrowings—in other words, that the debt/asset ratio is able to withstand many more upticks such as the one recorded for 1977.

The financial cushion implied by this analysis, however, is in part an illusion. First, the ratio is now near its post-World War II high, as it was not reduced significantly during the recent years of farm prosperity and asset price increases. More importantly, the average return on farm production assets is now about 3 percent while the interest charge on new farm loans averages about 9 percent. Given this relationship, further borrowing by the sector would tend to reduce its net income. If, other things unchanged, the debt/asset ratio were to rise to about 30 percent, the return to equity would fall to zero. In other words, increased borrowing cannot be sustained for long in the absence of income adequate to service the increased debt.

Other analytical approaches are more valuable in evaluating the relative usefulness and safety of ongoing increases in farm debt. The significance of increased debt financing can be assessed by examining whether it is financing increased capital formation or simply replacing internal financing of this capital flow. Panel A of chart 4 shows that increases in debt have recently been rising faster than capital formation. Thus panel B of the chart indicates that increased debt financing has recently replaced internal financing to a highly unusual degree. In this century, in fact, a comparably high ratio of debt financing to farm capital formation has previously occurred only once, during the ill-fated speculative boom of World War I. Upon compiling very comparable data, Tostlebe found that debt financing averaged 76 percent of farm capital formation during 1915–19.

Indeed, as shown in chart 5, the recent increases in debt are far outside previous bounds of their relationship to farm cash flow and net income. Such behavior could be regarded as warranted if future increases in income were in sight, as in 1972, or if the faster rise in debt were financing significantly greater capital flows expected to generate future income gains. In the absence of such an outlook, the increased debt poses instead a relatively greater future servicing and repayment burden. The recent ratios of debt financing to income flows have no precedents in this century. According to Tostlebe, the ratio of debt financing to net income averaged only 16 percent during 1915–19, and then fell to an average of just 2 percent over the next three decades. The current rapid rise in the ratio does have a precedent in World War I experience, however, as the ratio then rose substantially from averages of 7 percent in 1900–09 and 10 percent in 1910–14. Such increases in the ratio both then and now indicate that debt commitments are being incurred at an accelerated rate relative to income flows from which they must be serviced.

Assets compared with debt

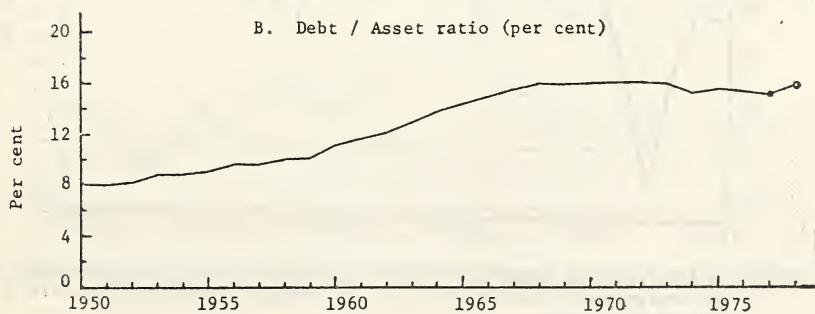
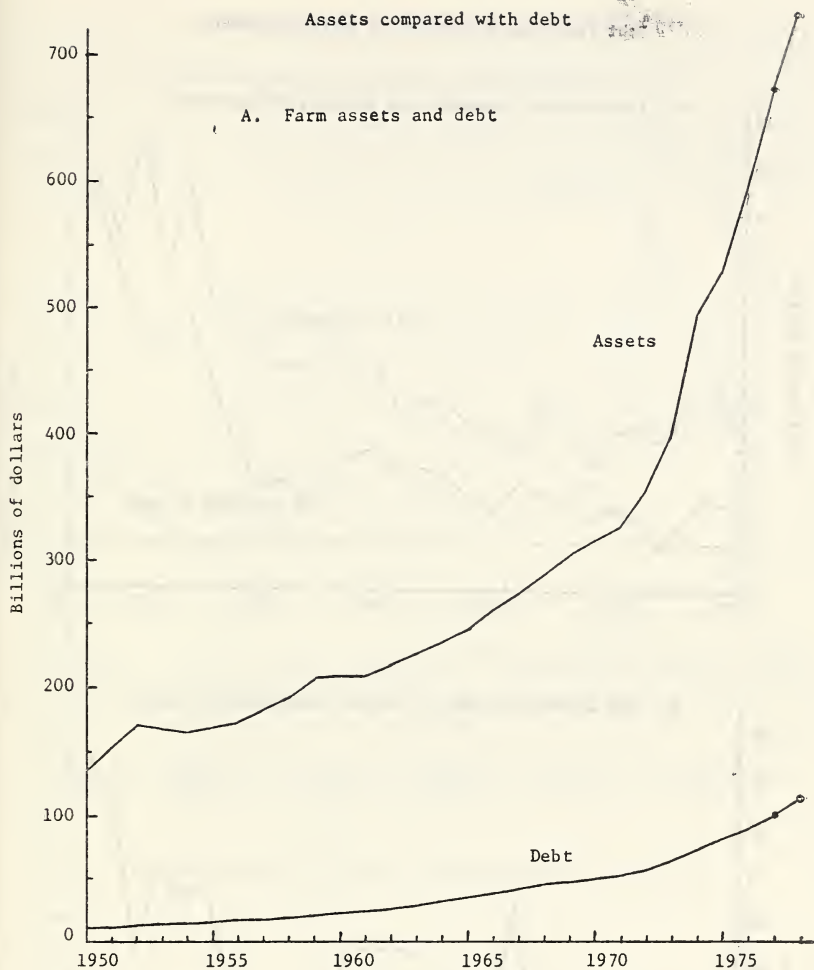
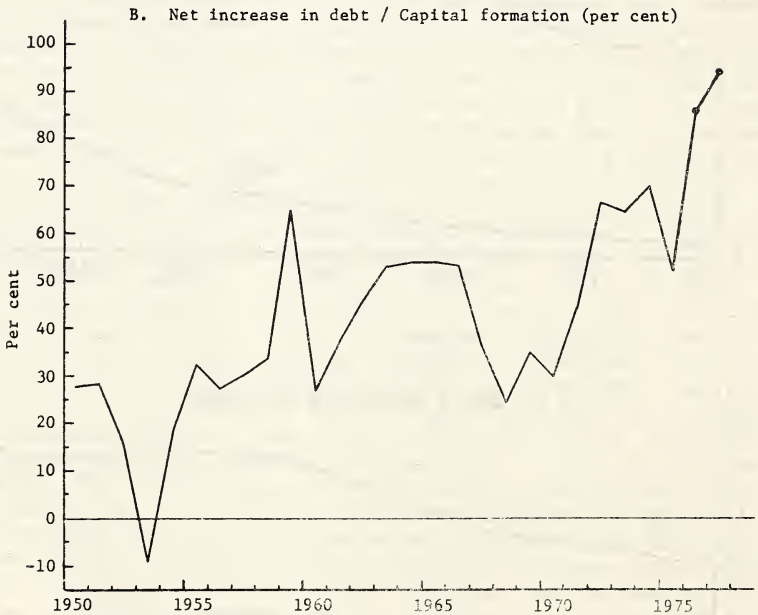
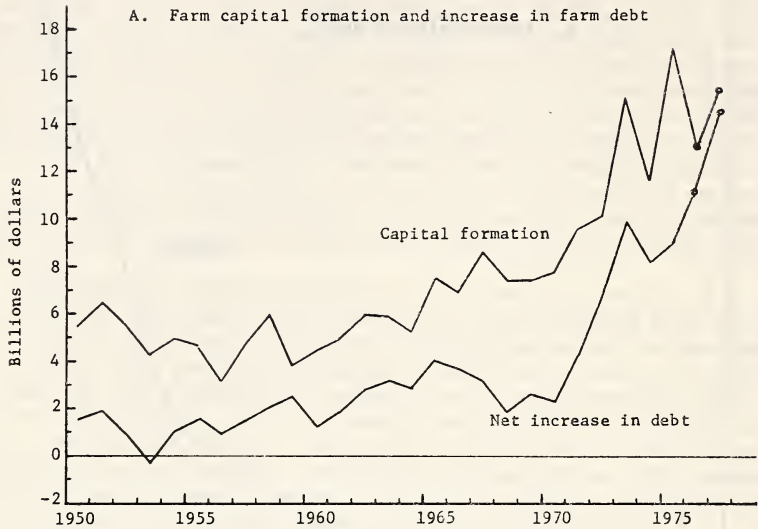


CHART 3

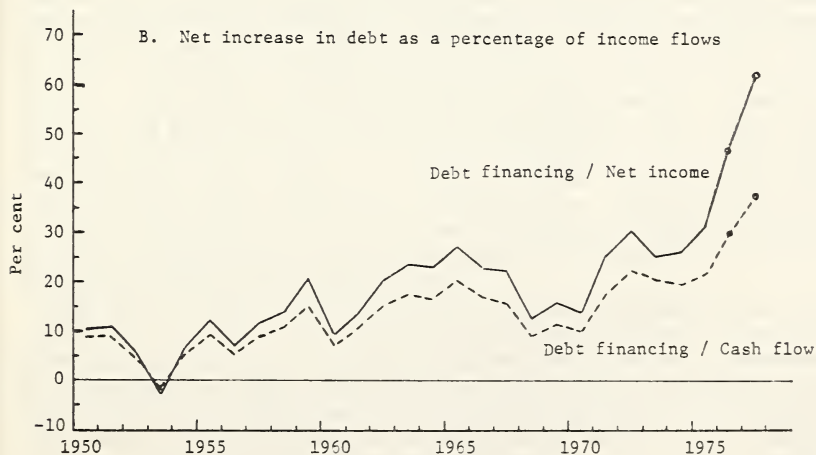
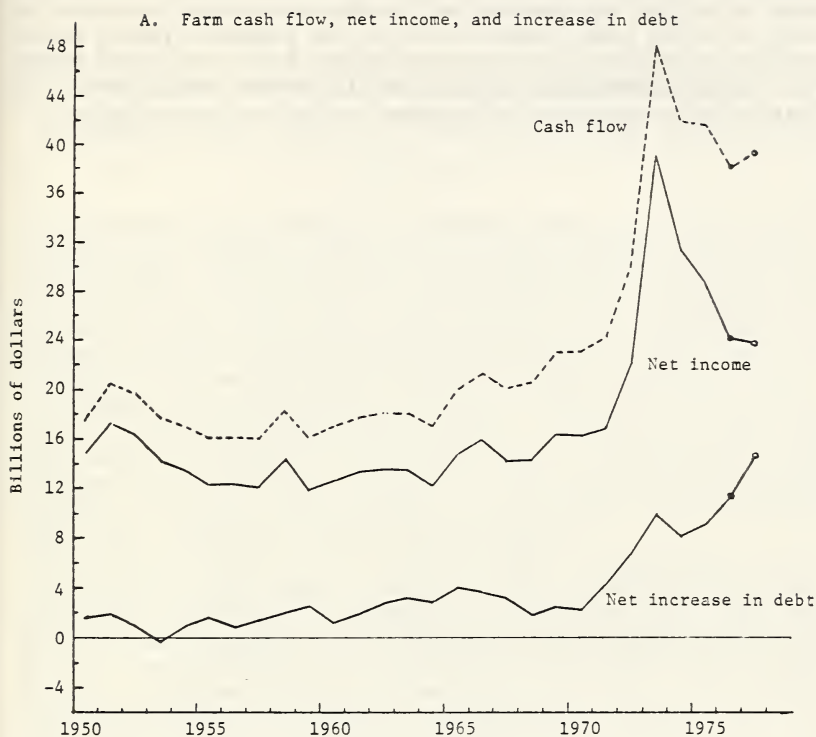
Debt financing compared with capital formation



Note: Capital formation consists of expenditures for machinery, buildings, and land improvements plus the net change in financial assets and in livestock and crop inventories.

CHART 4

Debt financing compared with income flows



Note: Cash flow is net farm income plus capital consumption allowances at replacement cost.

CHART 5

In summary, aggregate farm finance trends indicate a considerable potential for future financial problems, but it remains to be seen to what extent they will materialize. The key uncertainty is whether the level at which farm income settles in the postboom period proves sufficient to maintain the past appreciation of farm assets and to support further increases in farm debt. At current income levels, the financial ratios examined in this paper are not very encouraging.

ISSUES FACING THE FARM CREDIT SYSTEM

(By George D. Irwin, Director of Research, Farm Credit Administration)

The annual USDA Outlook Conference is always of great interest to those of us working in Farm Credit Administration and the Farm Credit System. But this year the interest has been even greater than normal, due to the deteriorated crop cash flow prospects emerging from the past 6 months commodity price skid. In fact, we probably have a tendency to focus too much on this, and too little on the relative improvement in livestock industry prospects after several bad years.

Situations such as the current one arouse our interest for two reasons. One is the need to evaluate how long the current crop situation may hold—are we in the pits of a cycle and soon to recover, or are we near a longer term norm? Some judgment on this question is the necessary basis for the System's loan decisions in the future, and for FCA's supervisory evaluation of bank lending policies.

The second reason for our interest is that a worsened agricultural setting provides the testing ground for policies followed in the past, and guides in developing refinements for the future. It is often said that bad loans are made only in the best of times. Optimism based on the then current situation is discounted, but usually, not by enough. Eighty cent feeder calves get discounted all the way to 60 cents in projecting cash flow, with scarcely a thought that we may see 30 cents. Or \$3 corn or 80 cents cotton may get discounted to \$2.75 and 60 cents, which turns out not to be a low point. Such optimism, I would remind you, could have been justified or bolstered in the past few years from the pronouncements of many public officials. We were told we were in a new era of tight worldwide supply-demand balances. We heard that U.S. devaluation and floating currency rates priced us competitive to the world at the price levels of 2 years ago. Some of us may have forgotten that other "feed the world" experts had told us the same story in 1967-68, just before prices fell out of bed. Like then, the stark reality of low price elasticity of demand—the strong price consequences of moderate excess production—has hit home. Thus the current situation provides us an acid test of past activities, and environment testing our ability to set a future course.

Note that I stated our great interest in this conference. I did not emphasize any great concern about the financial situation. We are, of course, concerned about any financial stresses faced by our borrowers, the owners of the Farm Credit System. We are not particularly concerned about the overall quality of the loan portfolio of the System. The reason for emphasizing this point traces back to the general question, what are the implications of large size and rapid growth of the Farm Credit System. I suspect that size and that growth may

have led many critics to suspect we had experienced unsound growth. My message here today is—we think otherwise. Let's first review that growth.

Since 1970, FLBA and PCA loans outstanding have tripled, from a bit over \$11 billion to the mid-30's. The System has become the largest overall lender to farmers, second to individuals in the mortgage area and second to commercial banks in short-term lending. It is also the majority lender to farmer cooperatives. Annual growth in yearend outstandings ranged from just over 11 percent in 1970 to a high of 25 percent in 1974.

Thus we have been coping with rapid growth and with large size. The opportunity for error would seem to be great. Much of the record remains to be written, of course. But we generally feel it will turn out to be a good record. FLB delinquencies have been minimal and collections have been normal. We have seen some definite increase in the percentage of lending going for refinancing, as compared to the past 3 years. Some debt extension would be normal, given 4 years depressed livestock conditions and 2 years of poor crops in some areas or depressed crop prices. But we still see refinancing to long-term debt not out of line with the 1970-72 period. On the PCA side, we would expect to see any difficulties appear more quickly. But so far, problems have been slight. Collection rates do appear to be down somewhat in recent months, but renewals are not up.

There are two problems drawing conclusions from the record so far in 1977. First, to say something is less favorable than during the 1973-76 period is not necessarily to say things are bad. Relatively, yes. Absolutely—it's not so clear. Second, the crop prices decline is a recent phenomenon, and problems may not yet be reflected in repayment statistics.

One cause for optimism is farmers' well-known capacity for belt tightening. This was illustrated most recently in associations serving cattle producers. Despite several years of adversity, loan experience remained good. The vast majority of farmers met their obligations—not necessarily without strains on their financial robustness, but they met them.

Let me turn briefly to several other possible areas of concern. At the outset, let me emphasize that funding is not a concern. The System has always been able to obtain all the funds borrowers want. It has been able to do so with highly rated bonds sold at minimal premiums over what the U.S. Government pays. We study and innovate to assure that access continues. Most recently, the consolidated Systemwide bond was introduced. Almost 3 years ago it was Systemwide discount notes. Thus we see little reason for concern that farmers will have any trouble getting all the funds they can constructively use, so long as they are willing to pay going market rates.

The concern we have is on the other side—how much farmers can constructively use. And the main issue here is the reduced cash flow to crop farmers. Those with the heaviest debt commitments will find themselves somewhat vulnerable. I want to touch on problems of two groups—*young farmers* and recent purchasers of farmland.

Young farmers.—Some of you are aware of the joint farm ownership lending programs between Farmers Home Administration and

the Federal Land Banks. The average age of borrowers in this program is about 36 years. The program is designed to bridge the ownership threshold for farmers who lack the downpayment requirements but demonstrate adequate cash flow to service a regular FLB loan plus an FmHA loan for the downpayment. During 1976, there were some 4,246 loans made under this program, and over 12,000 were made during 1973-75. It includes all ages, both young farmers and others. One would expect these borrowers to be the most vulnerable we have in the FLB portfolio. But the situation from a cash flow standpoint is less severe than one might imagine because the term of these loans averages longer. Indeed, our analysis suggests the debt service load per dollar of income isn't much greater than for all borrowers.

Recent land purchases.—The extraordinary land price increases in the past several years lead to musings over what would happen if we were to have half as spectacular a decrease. Those who express this sort of concern can point to declining farm incomes, and the higher price-to-earnings multiples. They can even cite scattered reports of land price declines in some areas. They then generalize to a concern over the FLB loan portfolio. I believe the concern is overstated. Loan to market value ratios did not increase in the recent past. Last year, they averaged 55 percent nationwide, and were only 56 and 52 in the St. Louis and Omaha districts, where the biggest price runup occurred. The fact is that the land turning at these high prices was going into very strong hands. I have had reports that a number of the "chart topping" sales were all-cash transactions! One must also recognize that a relatively small portion of land has changed hands at the highest price levels. A rough estimate of the FLB portfolio suggests the average loan/market value ratio at the end of 1976 might be 35 percent. A very large amount of land would support additional borrowing on a collateral basis. And large amounts of nonfarm income support cash flow to service such loans. Some 75 percent of FLB borrowers had nonfarm income in 1976, and nonfarm earnings were nearly 55 percent of farm earnings. Over 50 percent of our FLB borrowers had nonfarm income of over \$10,000 annually. The recent experience must at least raise the question of whether land may be being viewed as a store of value during an inflationary period, and priced on that basis, rather than as a productive asset valued on production capacity. We have a ways to go before understanding land price movements. But we know that those who predict them based solely on farm earnings changes haven't been very successful.

To sum it up, we would expect the farm income prospects for this year to result in some softness in land price. But the more pronounced effect may be a reduced rate of voluntary land turnover. That has happened historically as farm income fluctuated. Land price has shown itself to respond more to farm income increases than to decreases. For lenders, this may mean weaker demand for farm mortgage loans in the coming months. Borrowers should be in a buyers market, since insurance companies are expected to have ample funds to commit and to be under some pressure to place them. There is less possibility now than a few years ago that increased policy loans might dry up their sources during this period of rising interest rates. Unlike then, business and construction mortgage lending has been weak. We would expect to see

machinery purchases a major area of farmer belt tightening, and the demand for new borrowed funds for machinery to be weak. Ample supply conditions in several farm input industries, along with lower interest rates than the past 3 years, appear to be causing some increase in trade credit as a selling device. This could ease demands on short term institutional lenders.

Finally, CCC lending may have a combination of effects this year—partly just earlier sales, in effect, and partly a substitute for borrowing from commercial lenders.

We expect to be working with more farmers who have cash flow problems in some crop areas. The policy of Farm Credit System remains one of working with such borrowers through the period of stress, so long as there is any reasonable prospect of "light at the end of the tunnel." The strength of the Farm Credit System has always been unmatched skill in delivering a loan service—sound lending and sound servicing.

We see the prospects as good for the longer term "light," with the predominate food supplier role of the United States and the relatively slim margins of reserves. The new farm bill affords a longer term measure of stability in the commodity area. It may have as yet unsuspected effects on lending and on farm size enlargement. When coupled with proposals for crop and disaster insurance designed to limit downward yield risk, we will be facing the question of what happens to U.S. agriculture and lending in a less risky environment. Perhaps that stabilization will just offset the greater worldwide risks created in energy, other input, and currency value fluctuations. I leave you to think about that very important question as we move into the discussion period.

PENDING LEGISLATION FOR THE FARMERS HOME ADMINISTRATION

(By James E. Thornton, Associate Administrator, Farmers Home
Administration)

The Farmers Home Administration (FmHA) was established in 1946 as successor to the Resettlement Administration and Farm Security Administration, agencies well remembered for helping family farm agriculture through the crisis years of depression and World War II.

Under a bill now before Congress, Farmers Home will undergo another change of name and become the Farm and Rural Development Administration (FRDA). Secretary of Agriculture Bob Bergland, in his recent announcement of plans to reorganize the Department of Agriculture, asked for congressional approval of this name change.

FARM AND RURAL DEVELOPMENT

We hope the bill will pass by early next year, because the change of name for this agency is long overdue. "Farm and Rural Development Administration" will be much more descriptive of FmHA's present role as a multipurpose credit agency, serving both countryside and towns of the rural United States with farmer programs and a wide variety of other programs to meet family and community needs.

FmHA's concern in the beginning was confined to assisting farmers. The role was that of lender and counselor to farm families including share croppers who were striving to succeed as independent tenant farmers, or move up to ownership of the land on which they made their living. Soil and water conservation loans also were available in 17 Western States.

In evolving a service that came to be known as "supervised credit." Farmers Home county staff members maintained close contact with borrowers and gave them continuing advisory help on farming technology, and on farm and home management—all in the interest of a successful farming operation and an upward movement to prosperity for the family. Supervisory assistance was tailored to the individual family's need. FmHA in those early years administered four types of loans: farm operating, farm ownership, disaster emergency, and soil and water conservation loans.

But today presents a far different picture. Since the 1950's, Farmers Home has undergone almost continuous expansion in the scope and volume of its services. When Congress decided to extend to rural people the same variety of credit opportunities found in urban areas, it usually specified that new rural services would be provided through the FmHA network of nearly 1,800 localized county loan offices. Here was a rural credit delivery system already well established nationwide.

The first expansion of FmHA's mission came in 1949 with the rural housing loan program, originated for the benefit of farmers. In the early 1960's the rural housing and soil and water conservation programs were opened up to other rural people including those who lived in small towns.

Since the early 1960's, nearly all other types of rural housing, rural community facility, and rural business-industrial financing have been added to the Farmers Home portfolio.

Today, FmHA is the principal channel of Federal financing flowing to agriculture and the rural community through about 30 loan and grant programs under the Farm and Rural Development Act, and the National Housing Act.

This agency, which loaned about \$300 million in fiscal year 1960, moved \$7.2 billion in fiscal 1977 in the four primary rural development areas of farming, housing, community facilities, and business-industrial development. In summary, the main elements of program delivery were these:

Farm credit—92,460 loans for \$2.4 billion;

Housing—123,577 loans and 2,037 grants for \$3.1 billion;

Community facilities—2,453 loans and 1,430 grants for \$1.3 billion; and

Business and industry—584 loans and 143 industrial site grants for \$360 million.

The total comes to 222,684 loans and grants for \$7.2 billion.

Another overall increase of at least \$1 billion is budgeted for fiscal year 1978.

Obviously, "Farm and Rural Development Administration" is a more appropriate name to reflect such a variety of services to people in rural America.

SERVING SPECIAL NEEDS IN AGRICULTURE

For all the expansion and diversification, FmHA still carries a major responsibility in the field of agricultural credit.

Measures still pending on our legislative program are mainly concerned with enlarging and improving farm loan services, in ways that cannot be accomplished through administrative action.

The concept of rural development is not a movement away from farming. On the contrary, agriculture is center stage, the greatest rural resource. Farming comprises one-fifth of all the businesses in the country and, of course, an even greater proportion of private enterprise in the rural sector. The production, processing and distribution of food and fiber accounts for one-fifth of the gross national product, and more than 15 percent of all civilian employment. Rural development is an undertaking to build on this enormous asset by enhancing conditions of life in the rural environment that appeal to so many Americans.

Farm loan programs of FmHA are intended to support and sustain the family farm pattern and thereby fulfill a special need of great importance to the future of an agriculture based on individual family enterprise. These programs also give limited resource family farmers an opportunity to become more successful farmers, earn a better living, and play a greater role in the communities of which they are a part.

In the full spectrum of agricultural credit, FmHA at year's end will account for about 6 percent of all farm credit outstanding, with nearly \$4 billion of real estate and \$3 billion of nonreal estate farm loan accounts on our books. As a Government lender, our role is not to dominate, rather to supplement all financing available from commercial sources—but to take the longest step of any lender in emphasizing response to need.

In nonemergency programs of farm real estate and production loans, we are serving a limited constituency of family farmers and ranchers, operating as individuals and not as partnerships or corporations, who find themselves without other sources of necessary credit. This is our authority under present law. Those eligible include capable young farmers entering into farm operation or making their way through the early years of getting established. Some 40 percent of our borrowers in regular farm programs are under age 35.

We also administer the Department of Agriculture's disaster emergency loan program for farm operators in all categories of size and type of operation. In this past year of drought, severe winter and other weather adversity such as tornadoes, emergency lending has set a record of nearly \$1.2 billion for the fiscal year 1977.

We have guaranteed more than \$950 million of commercial lenders' loans under the emergency livestock credit program enacted in 1974.

We provide other special purpose long-term loans, such as for Indian tribal repurchase of reservation lands, improved use and conservation of soil and water on farmland, abatement of pollution, irrigation systems, subsidiary business enterprises on family farms, association grazing ranges benefitting farmers and ranchers—all serving to create better opportunity for the rural family to survive and prosper on the land.

We more than doubled the number of dollars loaned by FmHA for real estate purposes through participation lending with private institutions such as banks and the Federal land banks, and also with sellers of land who are willing to take downpayments and give long terms on the balance. In such cases, FmHA takes junior liens behind other lender liens. This provides joint credit in serving farmers. FmHA farm real estate lending in fiscal year 1976, totaling more than \$564 million, was more than matched by some \$692 million of participating lenders' loans to FmHA borrowers. A comparable, if not greater, result will be shown when figures are available for fiscal year 1977.

Beyond these loans directly related to agriculture, we administer programs under other labels that yield significant benefits to farmers. These include the financing of rural water and waste disposal systems, fire protection, medical service and other rural community facilities. The business-and-industry loans guarantee program is a stimulus to the agri-business economy of rural areas. The rural housing program is shared by farm families with other rural people. Farm housing credit as a rule is drawn from rural housing program funds—not against the budget for farm loans.

In fiscal year 1977, President Carter's special drought emergency program resulted in more than \$300 million of special projects to improve and safeguard rural community and farm area water systems that were badly affected by drought.

This emergency action, and the continuing program for buildup of reliable water systems throughout the rural United States, is of immense and enduring value to agriculture. Improvement of water facilities is one of the most important measures being taken to reduce the weather hazard always confronting the farmer and rancher.

OUTLOOK FOR IMPROVEMENT OF SERVICES

We have cited a great proliferation in volume and variety of programs, but that is not the only measure of success for Farmers Home credit. We look beyond mere statistics that tell us the number of applications approved or dollars spent. Attitude and philosophy carry a high priority in programs we administer. Our programs are people oriented, and our paramount concern must be to provide adequate help to those who need our help the most.

There are shortcomings in farm lending authorities that must be cured through legislation, and problems of program delivery that must be met through administrative action. But we foresee for the year 1978 a rising quality as well as volume of service—because of a favorable outlook for needed legislation and the administration's resolve to make improvements in agency structure and manifest a higher concern for public service.

On the administrative side, we intend to reemphasize more supervised credit to limited resource farmers, and more attention to the needs of the most disadvantaged applicants and borrowers.

We have found the agency slipping in recent times in the counseling service that has been a key to success of thousands of farm families making financial progress through these programs over the years. We have found also that more attention is needed in assisting minority and other limited resource borrower families in becoming successfully established in farming.

Slippage has been attributed to overload of work on FmHA county offices personnel who, as programs skyrocketed, remained responsible for nearly every type of loan—family, community, and organizational—in the FmHA portfolio.

We are looking into ways of restructuring the field system so that our people in county offices can concentrate their time on individual borrowers. We have plans to move up from the county office responsibility for all loans except those that serve individual applicants and borrowers. The processing of loans and grants to groups, communities and businesses may be shifted to district offices in areas such as community facilities, water and sewer, multifamily housing, and business and industry programs. This would relieve the county office of a large amount of time required in processing those types of loans.

FmHA districts within States can be realigned to correspond to substate development districts. This will enable FmHA to work more in harmony with local and substate regional agencies in supporting goals that people in those areas have established.

Computer based accounting, collecting and housekeeping functions are a partial, but not a total answer to restoring high standards of service to borrowers and program efficiency. The weakening of supervised credit work during the past 4 years came at a time when inflation of housing costs, home maintenance costs, farm production costs and sag-

ging farm prices called for stronger-than-ever supervised credit efforts on the part of FmHA county personnel. Instead, there was a weakening of that service. This was accompanied by a rising loan delinquency rate—from 12 to 17 percent in farm ownership loans, from 19 to 24 percent in operating loans, and from 8 to 21 percent in rural housing—and consequently a conservative turn of policy with respect to dealing with applicants of greatest need.

By direction of Secretary Bergland, we have suspended moves toward monetary default foreclosures on farm loans for the balance of this year while we study the situation of borrowers in trouble and the possibilities for helping them recover.

LEGISLATION

The other avenue for improvement is legislation now pending to revise and update our farm loan authorities. An administration bill has been sent to Congress, and hearings have been completed by agriculture committees of both Houses. We hope for enactment by early 1978.

The principal proposals are these:

- A doubling of the limits on nonemergency farm loans made or guaranteed by FmHA, bringing them more in line with the credit needs of family farmers under present day conditions. Limits would rise from \$100,000 to \$200,000 for farm real estate loans, and from \$50,000 to \$100,000 for production loans. The committees also are considering other proposals, not submitted by the administration, to authorize FmHA guarantee of other lenders' loans up to \$300,000 for real estate and \$200,000 for production purposes.
- Introduction of a cost-of-money interest rate on farm real estate loans, replacing the subsidized statutory rate of 5 percent, for borrowers who can afford the cost-of-money rate. However, the Secretary would retain authority to lend at a lower rate to the young farmer or other limited-resource farmer not yet in position to pay the cost-of-money rate. A reduction in interest subsidies would improve the outlook for increased loan levels;
- Negotiated interest rate within reasonable limits, determined by lender and borrower, on private lenders' farm loans guaranteed by FmHA, and other technical adjustments that would encourage commercial lenders to participate more in the guaranteed farm real estate and operating loan programs;
- Eligibility for family farm partnerships and corporations to borrow under nonemergency programs from which they are now excluded; and
- Separate authorizations for insured and guaranteed loans.

These amendments would bring about material improvement of farm loan services offered under the Farm and Rural Development Act. Under present terms, budget increases for 1978 have had to be held to modest proportions—\$100 million more for farm ownership loans, bringing the annual authorization up to \$550 million. The production loan program, already on a cost-of-money basis, is raised \$200 million over last year's ceiling to a level of \$825 million for the year.

Housing legislation already enacted will mean new activity for FmHA in the housing field. A \$900 million-a-year service in guarantee

of commercial lenders' housing loans to rural families of above moderate income will be introduced on the basis of negotiated interest rates. All FmHA insured lending will be directed to families of low and moderate income. FmHA will implement a rent supplement program similar to the section 8 authority of HUD. The rent supplement program will provide subsidy for 20,000 rental units. Occupants will pay 25 percent of their income as rent with the Government making up the difference between this amount and the market rental rate. Congregate facilities such as central dining rooms and medical stations may be included in multifamily housing projects designed to accommodate the elderly and handicapped. The farm labor housing program is extended to Puerto Rico and the Virgin Islands. The agency is authorized to pay for construction defects that slipped through FmHA inspection.

What also remains is to resolve confusion between farm loan authorities of Farmers Home and the Small Business Administration.

SBA has been brought into agricultural lending by acts of Congress authorizing that agency to classify farms as businesses eligible for loans under its regular and emergency programs. This has raised great problems for an agency not prepared either with personnel experienced in farm lending, on a delivery system designed to deal with farmers in any way comparable to the localized lending organization of FmHA. SBA has less than 100 regular offices serving the national agricultural domain where FmHA maintains nearly 1,800.

The Secretary of Agriculture and Farmers Home Administrator have entered into agreements with the Small Business Administrator to provide FmHA assistance in various ways to SBA in its handling of farm loan applications, and in referring applicants to the agency that would best serve their needs—SBA or Farmers Home as the case may be.

However, we hope that the coming year will bring agreement that SBA should be relieved of its farm loan responsibilities. We expect to recommend to Congress with the President's concurrence that Farmers Home emergency loan authorities be revised to include some advantages now offered only under the SBA authority.

Provisions of the FmHA legislation now pending in Congress will erase some of these differences, as they affect nonemergency credit. As a further step, we hope Congress will revise emergency legislation to direct farm emergency loans through the established FmHA credit delivery system, authorizing disaster emergency loans at a cost-of-money rate or at least 5 percent rate of interest, with no requirement of test for credit elsewhere.

These are highlights of our outlook for service to agriculture in 1978, contemplating our redesignation as the Farm and Rural Development Administration. We expect to pursue the course to which Farmers Home and its predecessor agencies have been dedicated for more than 40 years—bridging the gap between people's needs, and the assistance and support that can be provided only through Government.

COMMODITY OUTLOOK

THE INTERNATIONAL SETTING FOR SUGAR AND SWEETENERS

(By Robert N. McConnell, Director, Sugar and Tropical Products Division,
Foreign Agricultural Service, USDA)

In the year coming to an end, most aspects of the world sugar sector followed trends that had been evident in 1976. Sugar production continued to increase and despite some growth in consumption, year-end stocks spiraled upward. The one major aspect that didn't move upward was prices, which have generally declined.

But the sector may have reached a watershed. While further increases in production, consumption and stocks are expected in 1978, there is a basis for predicting higher market prices. And beyond 1978 there would seem to be some reason to expect a better balance between world supply and demand for sugar.

The Foreign Agricultural Service's first estimate of world sugar production in 1977-78 (September-August) is 90.7 million metric tons, raw value.¹ Based on past experience, this initial estimate will be within 2 percent of the final figure. Weather conditions can still affect production in the Southern Hemisphere countries, as well as harvests in some North Hemisphere countries.

The 1977-78 sugar outturn is a record, and would continue the steady growth in world sugar production which began with the 1974-75 crop. The forecasted crop is nearly 3½ million tons greater than the revised 1976-77 production figure, 87.3 million tons.

Significant production increases are expected in Europe, including the U.S.S.R., and South America. Total output of sugar from beets is expected to increase 7 percent, while that from cane will rise 2 percent.

Further increases in sugar consumption are expected next year. Presently, world usage of sugar for the 1977-78 crop year is placed at 85.7 million tons, about 3 million tons above 1976-77.

Based on the forecasted production and consumption levels, world sugar stocks at the end of the 1977-78 crop year could total 27 million tons, some 5 million tons above the estimated 1976-77 ending stocks. This would be the fourth consecutive year of stock accumulation. The forecasted level would be in excess of 30 percent of the anticipated consumption, the highest level since the end of the 1968-69 crop year.

The beet crop in Western Europe has been generally good and total sugar production in 1977-78 is expected to be 13.8 million tons, 4 percent above the 1976-77 outturn. For the European Community, production in the upcoming year will be a record 11.1 million tons compared to 10.5 million tons in 1976-77. Sugar output at 3.9 million tons

¹ All tons in this presentation are metric (2,205 lb).

will be up nearly 1 million tons in France due to favorable weather conditions. In fact, harvested area will actually be down slightly. Production in the United Kingdom is expected to be a record 1 million tons on a large beet outturn and good sucrose yields. Little change is expected in the German sugar output, as a record beet outturn only offset a reduced area and low extraction rate. Italian sugar production will be down about one-half million tons as unfavorable spring weather reduced the area planted. Also, unattractive prices influenced some farmers not to grow beets. Production in Spain will be down about 10 percent as drought conditions during the planting season reduced the area sown. The same is true for Greece.

For Eastern Europe, including the U.S.S.R., it is forecast that sugar output will be about 18 percent above the 1976-77 output. Most of this growth will take place in the U.S.S.R.; the 1977-78 production is forecast at 9.3 million tons, nearly 2 million tons greater than last year's freeze affected outturn. While there is little change expected in Russia's sugar beet outturn, completion of harvest before any significant freezes and reasonable, although not high, extraction rates provide the basis for the increased sugar outturn. If Russia ultimately produces the forecasted amount, it would be a record and also make the U.S.S.R. the world's leading producer of centrifugal sugar. Increased production is expected in Czechoslovakia, East Germany, Hungary, and Poland, while the Romanian outturn may decline 10 percent.

Production in Caribbean nations is forecast to be 8.3 million tons, about 300,000 tons above the 1976-77 level. Cuba's output is placed at 6 million tons, as better weather conditions aided recovery from last year's drought reduced outturn. It is expected that production will be up slightly in the Dominican Republic, the result of expanded harvested area and greater cane production. Some recovery is forecast in the Jamaican and Trinidadian sugar crops as cane and sucrose yields return to more normal levels from last year's low points.

Production in North America, including Central America, will total 10.4 million tons in 1977-78 compared to 10.9 million tons last season. Expanded production in most Central American countries could not offset the decline in U.S. output. Mexico's outturn of sugar is forecast to be nearly 2.9 million tons, setting a new production high for that nation. Higher yields are the basis for this forecasted level.

An increase of nearly 10 percent is expected in sugar production in South America. Brazil will account for most of the production increase, with output forecast to rise to a record 8.6 million tons, as harvested area and cane production continue to increase. There may be a small increase in outturn in Argentina and Peru, as well as a recovery in Venezuelan production from the very low 1976-77 level. On the other hand, output in Colombia is expected to decline again as dry weather conditions will have an effect on sucrose content.

In Africa, total output is forecast to increase 3 percent. After reaching an all-time high in 1976-77, it is forecast that production in South Africa will again increase in 1977-78 to 2.1 million tons. An expansion of harvested area and cane production will offset only average sucrose content. Sugar production in Mauritius may be off slightly as a result of insect problems.

The 1977-78 output of sugar in Asia will be lower than last year's level. Production may be off 4 percent from the 1976-77 level and

total only 18.9 million tons. Declines are expected in a number of countries, including the Philippines, Thailand, and the Republic of China (Taiwan). A decline in harvested area and yields—the result of low prices which reduced producer inputs—are the factors behind the estimated 15 percent drop in Philippine sugar production. On the other hand, the approximate 20 percent decline in Thailand's sugar output is ascribed to drought conditions, as there will be little change in harvested area. The sugar outturn in Taiwan in 1977-78 may be down 11 percent from the record 1976-77 level, as yields return to more normal levels. Production of sugar² in India is expected to be about equal to the 1976-77 level. However, good yields coupled with the expected expansion in harvested area, could result in a significant rise in the final production figure.

There will be only minor changes in the sugar outturns in Australia and Fiji. For Australia, the area harvested and yields in 1977-78 are expected to be nearly equal to the 1976-77 levels.

Earlier in my presentation, I stated that higher market prices could be expected in 1978. In view of the forecasted large increase in production and the pending addition to ending stocks, you may be wondering about this price prediction.

The basis for the prediction is the recently negotiated International Sugar Agreement (ISA). The Agreement is expected to enter into force on January 1, 1978. While initially the Agreement will operate on a provisional basis—that is, while a number of nations like the United States will have signed and agreed to implement the Agreement, their full fledged membership will be subject to parliamentary ratification—for part of the year, most provisions of the Agreement will be operative from January 1, 1978.

The price range established in the new ISA is 11 to 21 cents per pound, world market. Without getting into specific provisions of the Agreement, the price range will be defended by a combination of export quotas and stock accumulation and release. When prices are between 15 and 19 cents per pound market intervention will be at a minimum.

As the ISA comes into existence, shipments by exporting members will be regulated by quotas. It is estimated that these exporters have the potential to ship about 17 million tons of sugar in 1978. However, the market in 1978 cannot absorb this much sugar. Therefore, the Agreement provides that exporting member shipments will be limited to about 13.3 million tons. An additional reduction in this level may be made during 1978 if the market price remains below 11 cents. Also, quantities that exporters cannot furnish against their quotas will not be redistributed to other exporters when the market price is below 12 cents.

Some of the potential "surplus" sugar supplies will be absorbed by the stock provisions of the ISA—exporters are required to place into these stocks at least 1 million tons during the first year of the Agreement.

There also will be restrictions placed on importers which could have a price enhancing effect. Importing members will undertake to

² Including Khandasari.

limit their purchases from nonmembers, as a group, to 75 percent of the amount purchased during a historical period when prices are between 11 and 21 cents, and 55 percent when prices are below 11 cents.

Through the various Agreement elements I have mentioned, there will be "created," in the short run, an artificial balance between supply and demand. During 1978 it is probable that world market prices will rise in response to this balancing of supply and demand. There is a good chance that the price will climb within the ISA range before the end of the year.

Over the longer runs, the ISA, by assuring producers better prices, but at the same time protecting consumers from price run-ups of the type that occurred in 1974, could result in a fundamental balance between world sugar supply and demand. It is unlikely that major sugar exporters will cut back production significantly as a result of the ISA. However, production expansion programs will probably be keyed to market opportunities under the ISA.

A recently completed study, *World Sugar Supply and Demand, 1980 and 1985*, provides some indication of how the ISA may foster this supply/demand balance. One of the objectives of the study was to project production, demand and area for major countries, given different world price scenarios in 1980 and 1985. The price scenarios utilized were 7, 15, and 23 cents per pound, world market basis.

The study found that world sugar supply and demand could be in balance, in 1980, at 13.1 cents per pound. At prices below this level there would be an excess of demand over supply, while the opposite would be true if prices were above 13.1 cents.³ This price is within the range specified by the ISA. Therefore, the study lends support to the belief that the Agreement could foster a balance in the world sugar market.

A review of the 1978 international sweetener scene would not be complete without a look at high fructose corn syrup (HFCS). The United States, of course, is the leading producer of HFCS, but I intend to only comment on production in other countries. Most of the foreign production of HFCS can be found in the EC, Japan, and Canada. However, high fructose sweetener (hfs) is or soon will be produced in some other countries. For example, there is a plant in Singapore which has the capacity to produce 200 tons per month of high fructose sweetener (tapioca and sago are the main starches utilized); monthly capacity may be increased to as much as 1,000 tons in 1978. It is estimated that in 1978 hfs production, outside of the United States, will amount to about one-half million tons. Actually, installed capacity will be greater.

There have been a number of studies undertaken to determine the future production and usage of HFCS, and its impact on sugar markets. It would appear that, as a result of lower world sugar prices, the once envisioned rapid inroads by HFCS during the latter 1970's and early 1980's will not occur. Among other things, investment in new facilities is not an attractive use of capital vis-a-vis return rates on investment in other projects. Governmental policies may also affect HFCS production. Recent actions by the EC relative to isoglucose (which includes HFCS) are indicative of this course.

³ For 1985, the equilibrium price was found to be 15.6 cents.

U.S. SUGAR AND SWEETENER OUTLOOK

(By Thomas W. Little and Fred Gray, Agricultural Economists, Economic Research Service, USDA)

INTRODUCTION

Lower world sugar prices, the possibility of their continuance, and concern about their effect on producers, processors, and future sugar production heightened debate on national and international sugar policies in 1977. Interest in the discussions was high since the United States is a major sugar producer and also the largest importer of sugar from the world free market.

With domestic sugar prices dependent upon world supply and demand conditions, the immediate concern of the trade in 1977 has been the potential effect of a change in policy on prices. News reflecting pessimism or optimism about a change in domestic policy or a new International and Sugar Agreement (ISA) caused reassessments and adjustments in prices and in marketing and procurement strategies of buyers and sellers. This paper does not attempt to recount these adjustments, but instead presents our assessment of the current supply and demand situation and the outlook for 1978.

THE SITUATION

In presenting the situation let us focus, first, on sugar production, consumption, imports, and prices and then move to corn sweeteners, minor caloric sweeteners, and noncaloric sweeteners.

SUGAR

Prices

Raw sugar.—Recent price levels have been below production costs of most, if not all, U.S. producers. During the interval September, 1976 through October, 1977, U.S. raw sugar prices averaged \$10.79 per hundredweight. (New York spot basis). This level contrasts sharply with the average of \$14.82 per hundredweight for the first 8 months of 1976, and calendar year averages of \$29.50 and \$22.47 per hundredweight in 1974 and 1975, respectively. With one exception, monthly average prices have varied by no more than \$1 from the \$10.79 per hundredweight average for the last 14 months.

Wholesale refined.—U.S. wholesale refined sugar prices have followed changes in raw sugar prices. The Chicago-West Territory beet price averaged \$14.74 per hundredweight from August 1976 through October 1977. Similarly, the Northeast wholesale refined price for cane sugar was \$16.74 per hundredweight for the same period.

Wholesale refined sugar prices in the Chicago-West marketing territory were running about \$4 to \$4.50 above comparable raw sugar prices. Similarly, Northeast refined cane sugar prices have been running about \$6.50 to \$7 over comparable raw sugar prices.

Retail.—Retail sugar prices have also been relatively stable. The U.S. average price for October 1976 through October 1977 was 21.68 cents per pound (5-pound package). The difference between the average and the most extreme month was less than .007 cent per pound.

Sugar-containing products.—Prices of sugar-containing products have also been relatively stable in recent months. Ice cream is an exception, reflecting higher prices for dairy products. Similarly, retail prices for chocolate bars and chocolate sirup have also increased because of higher cocoa prices.

Production

Total production (domestic).—Total production of sugar in calendar year 1977 is expected to total 6.26 million tons, in contrast to 6.8 million tons in 1976 and 6.3 million tons in 1975.

Sugarbeets.—While sugarbeet acreage in the United States was down in most States, it expanded in Minnesota and North Dakota—the Red River Valley. Harvested acreage for 1977–78 is expected to total about 1.24 million acres, down 16 percent from last year. The drop in total acreage was due to a combination of lack of water in irrigated areas and low sugar prices.

With an expected national average yield of 20.2 tons per acre, the sugarbeet crop is now expected to total 25 million tons—down 15 percent from a year ago.

Beet sugar (raw sugar equivalent basis).—Beet sugar production from the 1977–78 sugarbeet crop is estimated to total about 3.3 million tons (raw sugar equivalent basis) in contrast to about 3.9 million tons in 1976–77. On a calendar year basis, beet sugar production in 1977 is expected to total about 3.5 million tons, compared to an outturn of about 4 million tons in 1976.

Sugarcane.—Harvested sugarcane acreage will likely total 760,000 acres in 1977–78, up fractionally from a year ago. Acreage for harvest expanded slightly in Texas and Hawaii, remained the same in Louisiana, and declined slightly in Florida. A projected lower average yield of 36 tons per acre is expected to result in a total crop of 27.6 million tons, down 6 percent from the crop 1976.

Cane sugar (raw basis).—October 1 growing conditions, sugarcane production currently indicated for harvest (less production of seed cane), and a normal sugar recovery rate for each producing area now indicate cane sugar production in 1977–78 may fall just short of last year's outturn of 2.72 million tons (raw value). Production in calendar year 1977 is expected to be down about 200,000 tons from a year ago.

Utilization

Deliveries.—Based on the trend for the most recent 12 consecutive months, calendar 1977 sugar deliveries will likely total around 11.1 million tons (including Hawaii) compared with 10.9 million tons in 1976. With prospects for a smaller 1977–78 beet crop, beet sugar deliveries have been lagging last year's pace. Beet sugar deliveries of

2.8 million tons (raw value) for January–September were down nearly 8 percent from the same period of 1976. For the year, deliveries are expected to total between 3.4 and 3.6 million tons, down from the 1976 record of 3.82 million tons.

Cane sugar deliveries of 5.74 million tons for January–September were up nearly 7 percent from the first 9 months of 1976. An increase in total demand and a decline in beet sugar deliveries increased the volume of cane sugar marketed. Barring unexpected developments, U.S. cane sugar deliveries for calendar 1977 seem likely to total between 7.5 and 7.7 million tons (raw value).

Per capita consumption.—Based on the trend in deliveries for the first 10 months, per capita consumption of refined sugar in calendar 1977 seems likely to total about last year's 95-pound level. This year's level continues the recovery beginning in calendar 1976 from the drop in consumption in 1975 caused by high sugar prices in 1974 and 1975. However, it falls somewhat short of the 97 pounds posted in 1974 and the 100 pounds-plus years of 1969–73.

Imports and exports

To satisfy our total demand for sugar, imports expand and contract. For the first 8 months of 1977, imports totaled 3.33 million tons (raw value), up nearly 9 percent from the same period a year ago. An increase in imports from foreign countries for January–August has occurred in response to:

- more than a 12-percent drop in shipments from Hawaii and Puerto Rico;
- a 3-percent decline in deliveries of mainland grown sugar to U.S. refineries;
- a 7-percent increase in cane sugar deliveries, which reflects smaller beet sugar deliveries;
- the threat of a dock strike; and
- an effort to keep inventory levels high in anticipation of U.S. raw prices increasing to a minimum of 13.5 cents per pound (New York spot basis) from levels of near 10 cents per pound.

Based on the trend for the most recent 12 consecutive months, U.S. imports in calendar year 1977 will likely total near 5 million tons, in contrast to 4.66 million tons in 1976.

During the first 9 months of 1977, U.S. sugar exports totaled about 20,000 tons (including liquid sugar—dry basis). At this pace, calendar 1977 exports will likely total between 25,000 to 30,000 tons, down sharply from the 70,000-ton level in 1976. A major reason for the decline is smaller shipments to Canada.

Stocks

Smaller crops and anticipation of higher domestic sugar prices coupled with restrictive import measures have increased the domestic demand for sugar stocks. U.S. sugar stocks are now at record levels. The October 1 level was 1.93 million tons (raw value), up over 600,000 tons from the preceding year. Of the 600,000-ton increase, 220,000 tons consisted of beet sugar. Beet sugar processors, in anticipating a 15-percent smaller crop this fall, are attempting to carry larger stocks so that calendar 1978 deliveries will not be down sharply from 1977 deliveries. Refiners' cane sugar stock of 1.13 million tons on October 1 were up about 50 percent from levels of a year ago.

It is now estimated that 1977 ending stocks will total about 3.7 million tons. This level contrasts with a level of about 2.8 million tons carried at year's end during the interval 1970-76.

Ownership of stocks is not possible to determine from reported statistics, since forward contracting, purchases for a buyer's account, and other marketing arrangements are not reported. Thus, it is difficult to estimate when and what percentage of the stocks may be drawn down in 1978.

Production and consumption

The U.S. wet milling grind in calendar 1977 is expected to total around 375 million bushels. About two-thirds of the recovered starch will be processed into corn sweeteners, the remainder sold as corn starch and dextrin.

Total domestic shipments of corn sweeteners for food use are expected to approach 3.5 million short tons (dry basis—DB) this calendar year, up from slightly over 3.2 million tons in calendar 1976.

While sugar prices have slowed the increase in corn sweetener shipments this year, HFCS shipments are expected to be up over 200,000 tons (DB). HFCS shipments in 1977 are expected to total near 1 million tons (DB). Conventional corn sirup (glucose) shipments are expected to total around 1.93 million tons (DB), up slightly from last year's level. And, dextrose shipments for food use will likely be around 550,000 tons (DB)—unchanged from a year ago.

Per capita consumption of corn sweeteners is expected to total about 32 pounds (DB) this year up from about 30 pounds in 1976. Most of the prospective increase will come from HFCS. HFCS consumption may total 9 pounds (DB) in contrast to 7 pounds in 1976. Dextrose consumption is expected to again total about 5 pounds (DB). Conventional corn sirup, consumption, it is estimated, will total about 18 pounds (DB).

Prices

Corn sweetener prices declined significantly in July. The September HFCS price of \$11.55 per hundredweight (DB Decatur, Ill.), was down 6 percent from \$12.32 per hundredweight in June. Similarly, dextrose prices in New York were down nearly 12 percent. Conventional corn sirup prices, New York basis, declined nearly 5 percent from June to September, while corn sirup prices in Chicago dropped nearly 18 percent.

Prices of No. 2 yellow corn, the kind typically used by corn refiners, averaged \$1.80 per bushel in September, down 20 percent from the June level and nearly 30 percent from April. Declining corn prices have helped corn refiners offset adjustments in demand caused by lower sugar prices.

While corn prices are sharply lower than earlier this year, so are prices of corn wet milling byproducts: corn oil is down nearly 27 percent from June, corn gluten feed down nearly 28 percent, and corn gluten meal down nearly 38 percent. The decline in corn refinery byproduct prices comes not from the larger corn crop and lower corn prices but from this fall's sharply larger U.S. soybean crop and the resultant drop in soybean meal and oil prices with which corn refinery byproduct prices compete.

OTHER CALORIC SWEETENERS

Honey

Honey production in 1977 will likely total around 184 million pounds, down 8 percent from 1976. Supporting evidence comes from the reported 1977 output of 101 million pounds of honey from commercial producers in 20 States with 300 or more colonies. The U.S. average yield of 53.3 pounds per colony for commercial producers was down nearly 11 percent from last year, and there was virtually no change in the number of honey colonies from 1976 to 1977.

While U.S. production was down this year, U.S. imports are about equaling last year's pace. Imports could total about 60 million pounds for calendar 1977. U.S. exports appear likely to total no more than 5 million pounds in calendar 1976. If present indications for U.S. production, imports, and exports are about as expected, total domestic disappearance may fall only slightly below last year's 260 million pounds.

Maple sirup

U.S. maple sirup production totaled 1.22 million gallons in 1977, up nearly a third from 1976. Two States, Vermont and New York, account for about 60 percent of U.S. output.

With U.S. production up, imports are off—nearly 30 percent for sugar, 7 percent for sirup.

NONCALORIC SWEETENERS

Both Houses of Congress recently passed an act to delay a proposed Food and Drug Administration (FDA) ban on saccharin for 18 months. Differences in earlier House and Senate bills were resolved in a Senate-House conference, and the new act has been sent to the President for his signature.

Despite the recent uncertainty concerning future saccharin food use, imports for the first half of 1977 totaled 1.45 million pounds, up over a fourth from a year ago. If this pace continues, calendar year imports will likely total between 3 and 3.5 million pounds, compared with 2.7 million pounds in 1976.

THE OUTLOOK

In looking ahead to 1978, supply, demand, and product movement are expected to play a greater role in the market as the domestic loan program and the International Sugar Agreement are implemented. As the year proceeds, the new loan program and the ISA will be evaluated. Concerns about future domestic policy will be raised. Also, solutions to problems such as the discontinuance of the publication of the New York spot price must be satisfactorily found.

SUGAR

Prices

Since September 15, sugar producers and processors have been assured a price based on the support level of 13.5 cents per pound (raw value) for 1977 crop sugar. This assurance first came in the form of a price support payment to processors. This program, however, is to be terminated in accordance with regulations implementing the loan

program for sugar called for in the Food and Agricultural Act of 1977, and signed by President Carter on September 29.

The act, to be implemented about November 8, stipulates that the price of sugar shall be supported at 52.5 percent of parity, but not less than 13.5 cents per pound (New York spot basis), and that sugarcane and sugar beets be supported at a level which will reflect the growers' equivalent share of 13.5 cents.

Since world sugar prices are expected to remain below levels which would yield a domestic price of 13.5 cents through much of 1978, domestic raw sugar prices are expected to approximate the 13.5 cents per pound support level.

For domestic beet growers the support price will yield a minimum price per net short ton of sugar beets of average quality of about \$22.84. This return compares with an average return of \$19.70 per ton in 1976. For domestic cane growers, the minimum price per net ton of average quality cane will be about \$18.37 in Florida and \$15.90 in Louisiana. These values contrast with returns of \$14.90 and \$12.60 per short ton, respectively, received by Florida and Louisiana growers for their 1976 crop. Support prices in Hawaii, Texas, and Puerto Rico are similarly expected to average higher than prices received for sugarcane in 1976.

With the U.S. raw price soon to equal the support price of \$13.50 per hundredweight, wholesale refined sugar prices are expected to rise and maintain current differentials. Retail prices can be expected to increase as well, though increases may lag wholesale price changes. Next year we can probably expect retail prices to be in the neighborhood of 25 cents per pound, and relatively stable. While prices of sugar-containing products have been relatively stable in recent months, prices will average higher in 1978, reflecting among other things, higher sugar costs. The amount of increase will depend on the volume of sugar in each product, manufacturing costs, prices and other ingredients.

Production

At present we do not expect sugar production in 1978 to be greatly different from this year's prospective crop of 5.9 million short tons (raw value). The first official indication of next year's beet crop will be in the January report *Prospective Plantings*, while the first indication of sugarcane acreage will be the quantity of seed cane planted in 1976, which will be reported in the *January Crop Production—Annual*.

Returns based on the support price are expected to result in higher incomes for domestic sugar producers than would have been possible in the absence of a support program. Still, some producers in some regions may not cover their total costs. However, most are expected to more than cover variable costs. Returns from sugar beets and sugarcane may, therefore, be more attractive than alternative crops. For efficient producers the support price may be sufficient to promote some expansion. Overall, the acreage is not now expected to change appreciably.

Sugar consumption

Since sugar deliveries in 1978 are expected to again total about 11 million short tons (raw value) and population is expanding, a decline

in per capita sugar consumption of about 1 pound is anticipated. Per capita consumption in 1978 is expected to total about 94 pounds.

Imports

Imports of foreign sugar in 1978 are now expected to total about 4.6 million tons. In arriving at this estimate it was assumed that beginning stocks, now projected to total about 3.6 million tons, will decline by about 500,000 tons in 1978. If a drawdown in domestic stocks of this magnitude does not occur, our import requirements may be higher and price improvement in the world market quicker. Conversely, a larger drawdown will lower our requirements, and slow the recovery in world sugar prices.

CORN SWEETENERS

The wet milling grind is expected to increase about 7 percent in 1978. Dextrose and conventional corn sirup shipments are expected to approximate 1977 levels. High fructose corn shipments are expected to increase about 20 percent. Total shipments of HFCS for 1978 are now projected to total about 1.2 million tons (dry basis) or 1.7 million tons (wet basis).

High fructose corn sirup prices are expected to continue to be determined by the price of sugar, since HFCS and sugar are close substitutes in many industrial uses. With higher sugar prices, returns in the wet milling industry are likely to improve, also.

U.S. AND WORLD COTTON OUTLOOK

(By Russell G. Barlowe, Agricultural Economist, Economic Research Service, USDA)

"No man is an island, entire of itself; every man is a piece of the continent, a part of the main; . . ."—"Devotions," John Donne, 1624.

This famous quotation about human interdependence is as true today as when it was written in the 17th century. In a broader sense, this old expression also appropriately describes modern-day economic interdependence among nations with regard to commodities, such as fibers and textiles. For instance, the domestic cotton situation must be considered in the context of international developments. After all, as shown in figure 1, the United States is one of the world's leading raw cotton producers, consumers, and traders. During 1976-77, we ranked third in global cotton production and consumption with 18 and 11 percent of the total, respectively, and first in exports with 27 percent. This season, our 13.8-million-bale crop is by far the largest in the



FIGURE 1
(212)

world. The United States, together with the U.S.S.R. and the PRC pretty well dominate global cotton production, consumption, and exports.

WORLD SITUATION

World cotton production in 1977-78 is expected to exceed consumption for the first time in 3 years. Current projections place output at a record high 64.8 million bales, nearly $3\frac{1}{2}$ million above consumption. Thus stocks, which dropped nearly 12 million bales during the past 2 years to a 24-year low of 18.6 million on August 1, 1977, will likely increase moderately during 1977-78 and total close to 22 million by the end of the season—figure 2. Still, next summer's carryover will be relatively low, providing only about a 4-month supply for global textile mills. Around a 5-month supply is generally considered desirable.

This season's 12-percent bigger world cotton crop reflects significantly larger production in the United States, U.S.S.R., Turkey, India, Pakistan, Mexico, Greece, Colombia, and Nicaragua. The United States is accounting for nearly one-half of the increase as relatively high cotton prices at planting time prompted U.S. farmers to plant over 15 percent more acreage this year.

Meanwhile world cotton consumption during 1977-78 may remain near last season's 61.2 million bales, reflecting sluggish textile demand in major consuming countries and continuing intense competition from manmade fibers. During 1976, global manmade fiber production was equivalent to a record-high 54 million bales of cotton, up 14 percent from a year earlier.



FIGURE 2

This season's larger world cotton production prospects and relatively static demand have caused cotton prices in international markets to tumble since last spring. However, prices have exhibited a more stable tone in recent weeks. The Northern Europe Outlook "A" index, perhaps the best measure of world cotton prices, has fluctuated around the 58- to 60-cents-per-pound level during the past 2 months after dropping nearly 30 cents during the preceding 6 months.

Some expansion in international raw cotton trade is foreseen this season. World exports are projected to total around 0.5 million bales above last season's 18.1 million. Imports by Korea and Japan, two of our best customers, are expected to remain sizable. However, with larger supplies available for export in the U.S.S.R., Turkey, Egypt, Mexico, and Pakistan, U.S. exports may decline a little and our share of global trade may slip to about 24 percent from last season's 27 percent (figure 3).

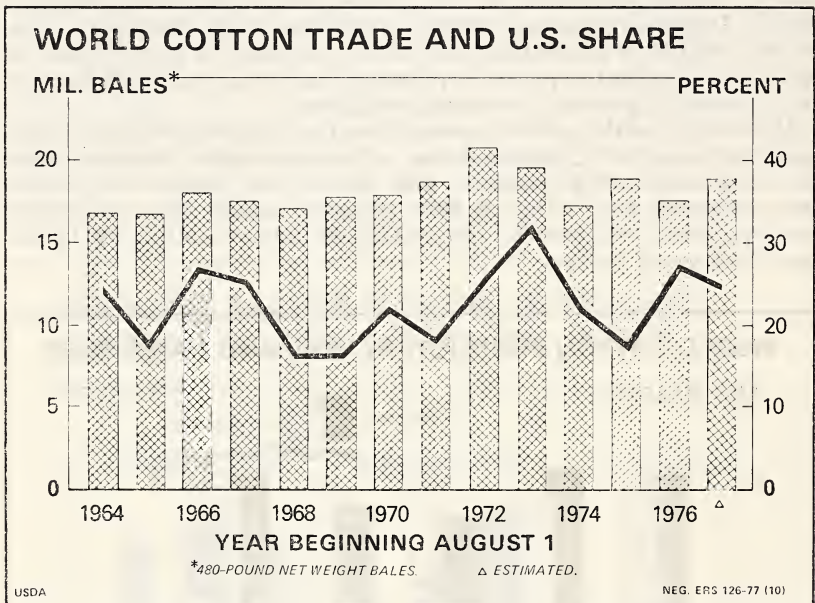


FIGURE 3

The world cotton outlook for 1978-79 is highly tentative at this early date. If prices next spring are near current depressed levels, smaller world cotton acreage and production may be in the offing for 1978-79, even if production is subsidized in a number of countries. However, these low prices would encourage mills to use more cotton if overall textile activity picks up in the United States, Western Europe, and the Far East. This situation would result in an improved supply demand balance for cotton. On the other hand, if cotton prices recover somewhat by next spring, thus boosting production prospects—and demand remains weak—a further buildup in world stocks could occur during the 1978-79 season.

DOMESTIC SITUATION

Now let's zero in on the current U.S. fiber and textile situation. Recent trends in consumption of cotton, wool, and manmade fibers have generally paralleled overall economic activity. As illustrated in figure 4, this was particularly evident during the 1974-75 recession. This year, however, moderate growth in gross national product and rising personal incomes are boosting consumer purchases of household and industrial textile products. And even though the large apparel market has shown little improvement in recent months, total U.S. textile sales are running slightly above the 1976 level. However, the impact of this retail activity is not being fully reflected at U.S. textile mills, as near record large textile imports are capturing a growing share of the domestic market. Imports of cotton and wool manufacturers now account for about one-fifth and one-half of products sold over retail counters, respectively. Textile imports represent about 6 percent of the domestic manmade fiber market. Still, I expect U.S. mills to consume around 12 billion pounds of fiber during calendar 1977, up about 3 percent from last year (figure 4).

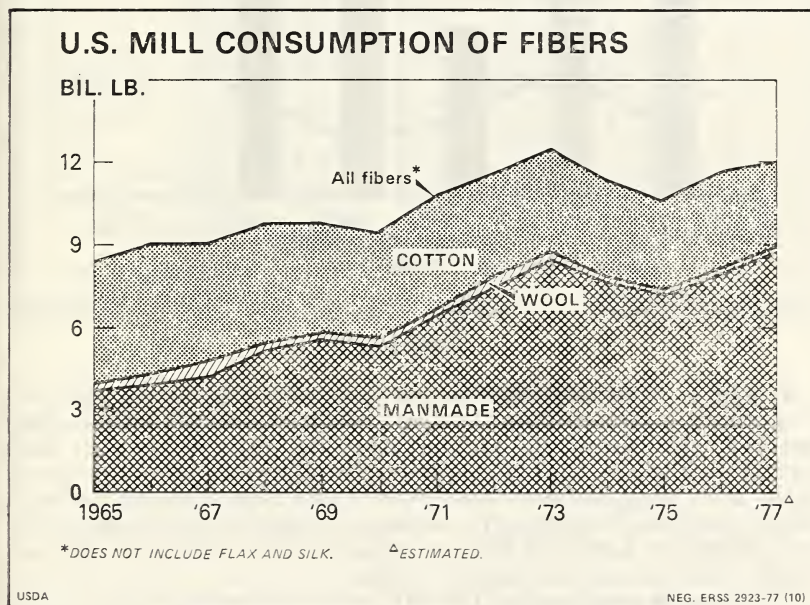


FIGURE 4

With tight cotton supplies and high prices relative to manmade fibers early in the year, cotton's share of this growing market is slipping. Cotton may account for a record low 26 percent of total use this year, compared with 29.4 percent in 1976. However, cotton's share is expected to rebound in 1978, reflecting larger supplies and more competitive prices.

Large crop dominates 1977-78 outlook

Cotton prospects for 1977-78 are highlighted by sharply larger production, slightly weaker demand, and increasing stocks. The 31-percent larger crop is boosting the supply to about 16.8 million bales, the highest since 1973-74. But with disappearance down slightly, next summer's carryover could total 5½ to 6 million bales, sharply above beginning stocks of 2.9 million (figure 5).

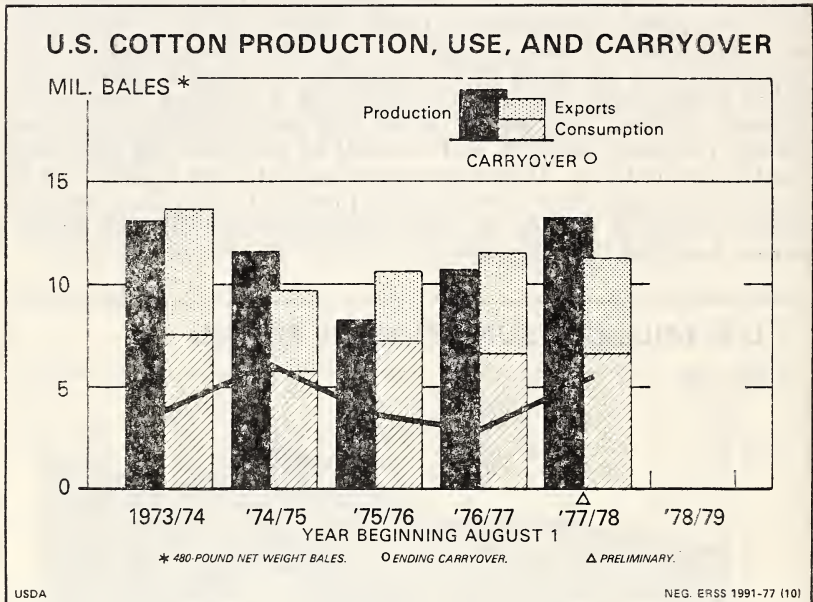


FIGURE 5

The 1977 cotton crop is the largest since 1965. Production will total 13.8 million bales, based on October 1 conditions, up 3¼ million from last year and nearly 2½ million above the 1972-76 average. Both acreage and yields are up sharply, reflecting relatively high cotton prices last spring and favorable growing and harvesting conditions in major producing regions. The national average yield is estimated at 503 pounds per harvested acre, up 38 pounds from last year and moderately above the average of recent years.

With nearly ideal weather this fall, cotton harvesting is off to a fast start. By early November, two-thirds of the crop had been picked, sharply ahead of normal and nearly double last year's pace.

A recordbreaking 68 percent of the 1977 cotton crop is being produced in the two western regions of the Cotton Belt. In the Far West, production is up 16 percent, reflecting larger acreage. Although limited water supplies dropped yields moderately, they remain relatively high. In the Southwest, larger acreage and higher yields are boosting the crop 57 percent to the highest level since 1949. Moving eastward to the Delta, the prospective one-third increase in production is due to higher yields. However, dry weather and insect damage have sharply cut yields in the Southeast. Cotton continues to lose ground in

this region, accounting for only 4 percent of 1977 U.S. production (figure 6).

U.S. COTTON ACREAGE, YIELD, AND PRODUCTION

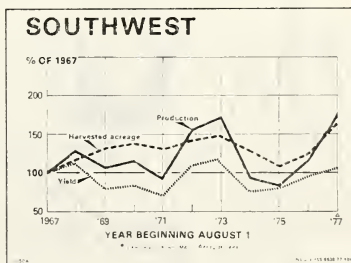
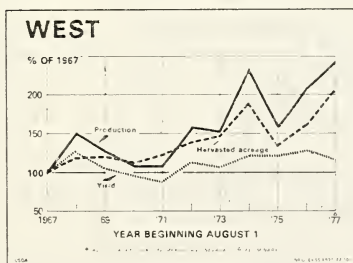
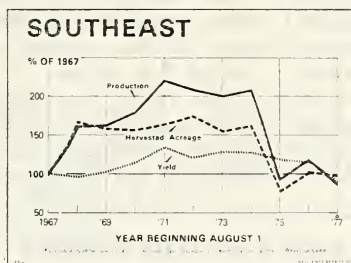
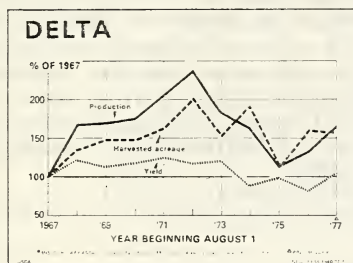
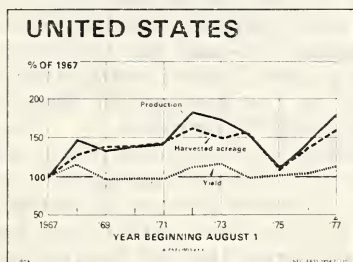


FIGURE 6

Low cotton prices squeeze farm income; but mill use expected to benefit

Many U.S. cotton farmers this year are again caught in a cost-price squeeze. Spot market prices have dropped sharply since the crop was planted and in most instances are now below the total cost of production. Current calculations indicate a national average cost of around

55 cents per pound for the 1977 crop (including land and management). Although this is down about 2 percent from a year earlier due to higher yields per acre, costs remain relatively high. In comparison, SLM 1 $\frac{1}{16}$ -inch cotton has been selling for around 47 to 48 cents per pound in recent weeks, down from about 75 cents last spring. Thus, many producers who did not forward contract their crops this year may not be able to cover their total costs, although they will be able to cover direct costs, estimated Beltwide at around 43 cents per pound.

Cotton producers who forward contracted their 1977 production are faring much better. An estimated one-fifth of the U.S. crop was booked ahead at an average price reportedly of around 65 cents per pound. Last year, about one-half the 1976 crop was forward contracted. This season's more limited contracting reflects recent relatively weak demand in the face of the large 1977 crop and the consequent sharp decline in cotton prices.

The current depressed level of cotton prices is symptomatic of one of the most nagging problems confronting our cotton industry today. This problem is one of widely fluctuating cotton prices. As shown in figure 7, spot market prices have varied from less than 40 cents per pound to over 80 cents during the past 4 marketing years. Last season proved to be very profitable for most cotton producers as farm prices averaged a record-shattering 65 cents per pound, over 20 cents above loan and target price levels. But "what's good for the goose is not necessarily good for the gander" as U.S. mills ended up paying around 80 cents a pound for cotton, 20 to 30 cents more than for manmade fiber staple. The result was obvious—mills switched from cotton to manmade fibers in an effort to cut costs. Cotton's reduced market share translates into an apparent loss of around 800,000 bales in domestic cotton consumption during calendar 1977.

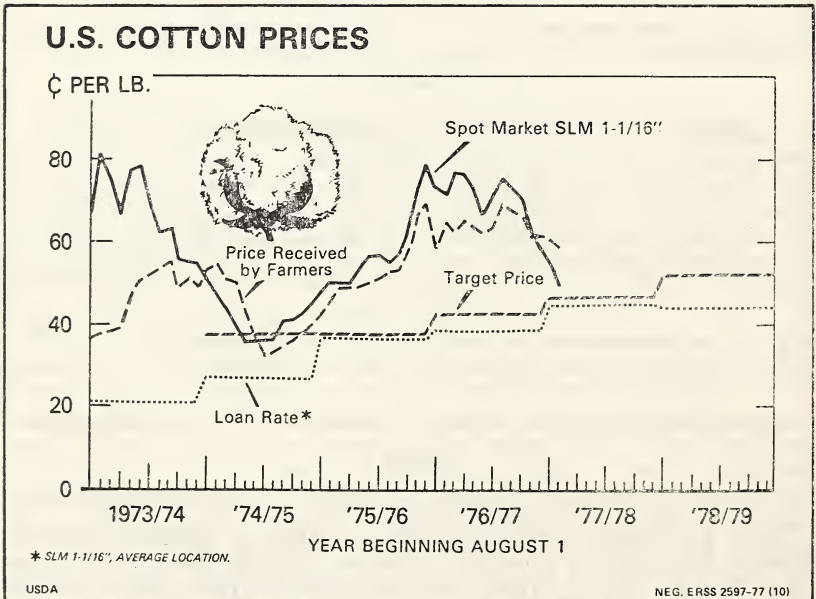


FIGURE 7

Figure 8 illustrates the recent divergent trends in mill use of fibers. while the daily rate of cotton consumption has been falling over the past 2 years, use of noncellulosic staple has trended up and is now running 10 to 15 percent above year-earlier levels. Rayon and acetate staple consumption is up slightly. In contrast, recent monthly cotton use is down around 5 percent from a year ago to an annual rate of 6.3 to 6.4 million bales.

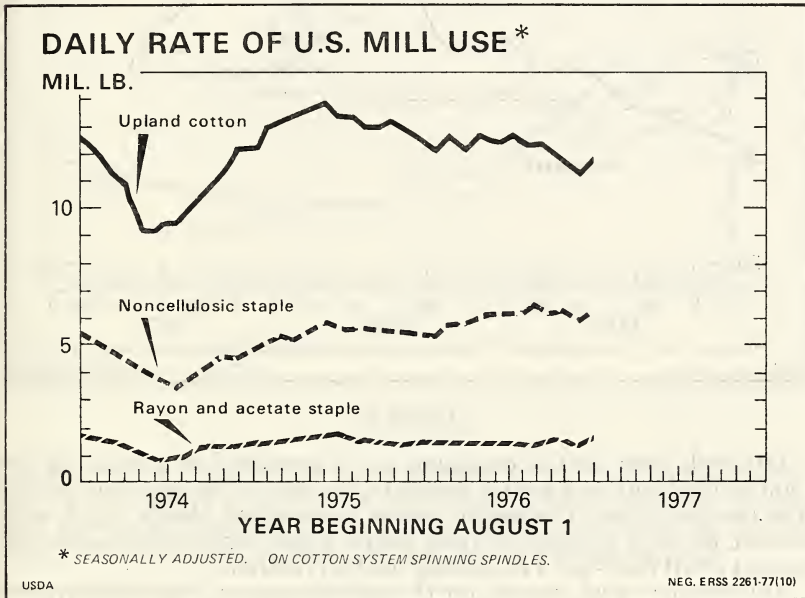


FIGURE 8

However, I do look for some recovery in cotton consumption based on today's more competitive prices. U.S. textile mills now are paying around 56 cents per pound for Middling $1\frac{1}{16}$ -inch cotton. This is about the same price they are paying for polyester staple and moderately less than for rayon staple. As a result, cotton is enjoying its strongest competitive position since early 1975 (figure 9). Thus, depending on general economic conditions, a gradual improvement in the rate of use is likely during the balance of the 1977-78 season. For the year as a whole, U.S. mill use may total near the last season's 6.7 million bales.

Cotton producers are seeking to bolster demand for their products by increasing contributions for research and promotion. Under provisions of the amended Cotton Research and Promotion Act of 1966, producers voted last December to contribute up to 1 percent of the value of each bale sold, in addition to the previous \$1 per bale assessment. The supplemental contribution has been set at four-tenths of 1 percent for the 1977 crop, meaning an additional assessment of \$1 per bale or so. As a result, Cotton Inc. has budgeted \$20.5 million for calendar 1978 upland cotton research and promotion, compared with \$14 million this year.

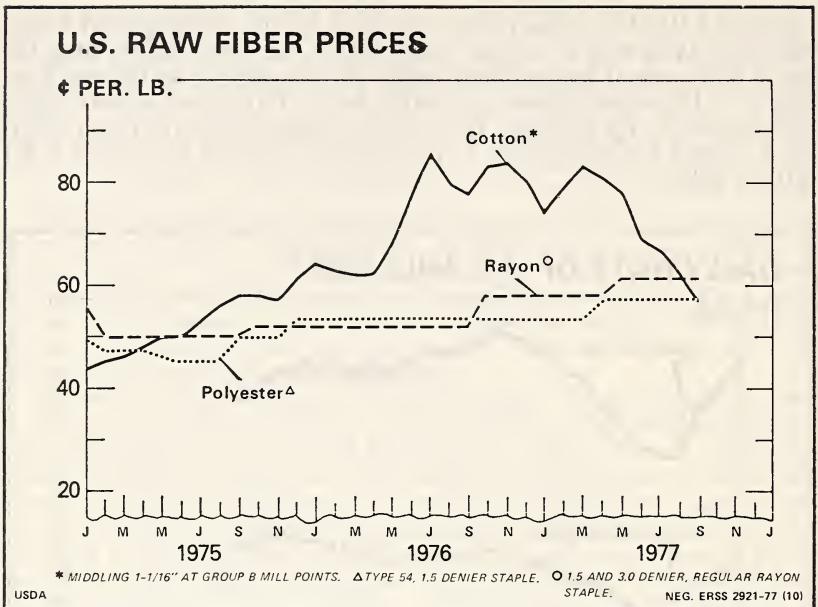


FIGURE 9

Although more cotton continues to be consumed in producing the popular corduroy and denim products, the rate of increase has slowed over the past year. The major reason is increased blends which now account for over a fourth of total denim fabric output. Still, about 90 percent of all fibers used in making denim is cotton.

Another source of concern for the cotton economy is textile imports. As mentioned earlier, about a fifth of U.S. demand for cotton goods this year is being satisfied by imports, which may total just slightly below 1976's record high 11½ million equivalent bales of raw cotton. However, it must be kept in mind that many of these imports are made from U.S. cotton. For instance, practically all raw cotton consumed in Korea, half in Taiwan, over a third in Japan, and a fourth in Hong Kong, is imported from the United States.

Exports of U.S. cotton textiles are also running at relatively high levels. Shipments during 1977 may nearly match last year's 0.86 million equivalent bales. Still, the net import textile trade balance remains large (fig. 10).

Future U.S. textile trade will be governed not only by economic conditions here and abroad but also by international trade agreements now being hammered out. The Multi-Fiber Arrangement (MFA), the 3-year old international umbrella that sanctions bilateral quota restrictions between nations, expires December 31. The United States is supporting a renewal of the MFA with little change. The proposed MFA would continue to allow an overall growth rate in textile imports of 6 percent but would allow more severe restrictions to protect heavily import-impacted items. The United States now has 18 bilateral agree-

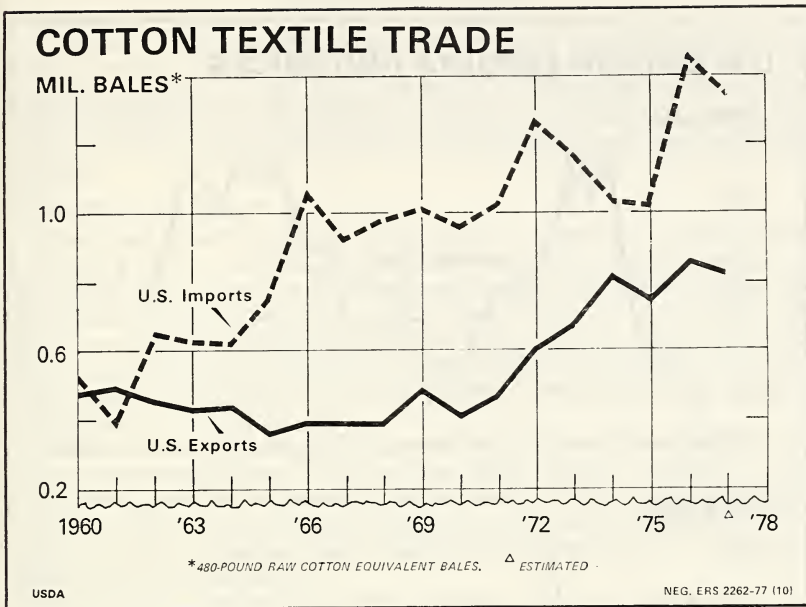


FIGURE 10

ments with other nations, 11 of which are up for renewal now and 7 more in the next 2 years. As of early November, a bilateral pact had been concluded with Hong Kong and one had been reached in principle with Korea, two of our major sources of textile imports.

Export prospects

Relatively strong foreign demand for U.S. cotton during 1976 and early 1977 resulted in exports of 4.8 million bales during the 1976-77 season and sales of over 4 million for delivery this season. Between January 1976 and July 1977, net U.S. export sales averaged about 0.5 million bales per month. However, sales have slowed since early August reflecting large competitive supplies of foreign cotton and less competitive U.S. cotton prices in international markets (fig. 11).

U.S. cotton export prospects for the 1977-78 marketing season are highly uncertain at the moment. There are now two widely differing viewpoints being debated. One scenario points to the current relatively large U.S. export commitment of 4½ million bales and argues that even if net sales during the balance of the season remain near the depressed August-October level, shipments will amount to 5 million or more. However a more pessimistic stand is taken by those who maintain that exports will total 4 million bales or less, based on anticipated foreign cotton consumption of nearly 55 million and production of around 51 million. This scenario, unlike the previous one, assumes that any stock rebuilding abroad will be accomplished with cheaper foreign growths.

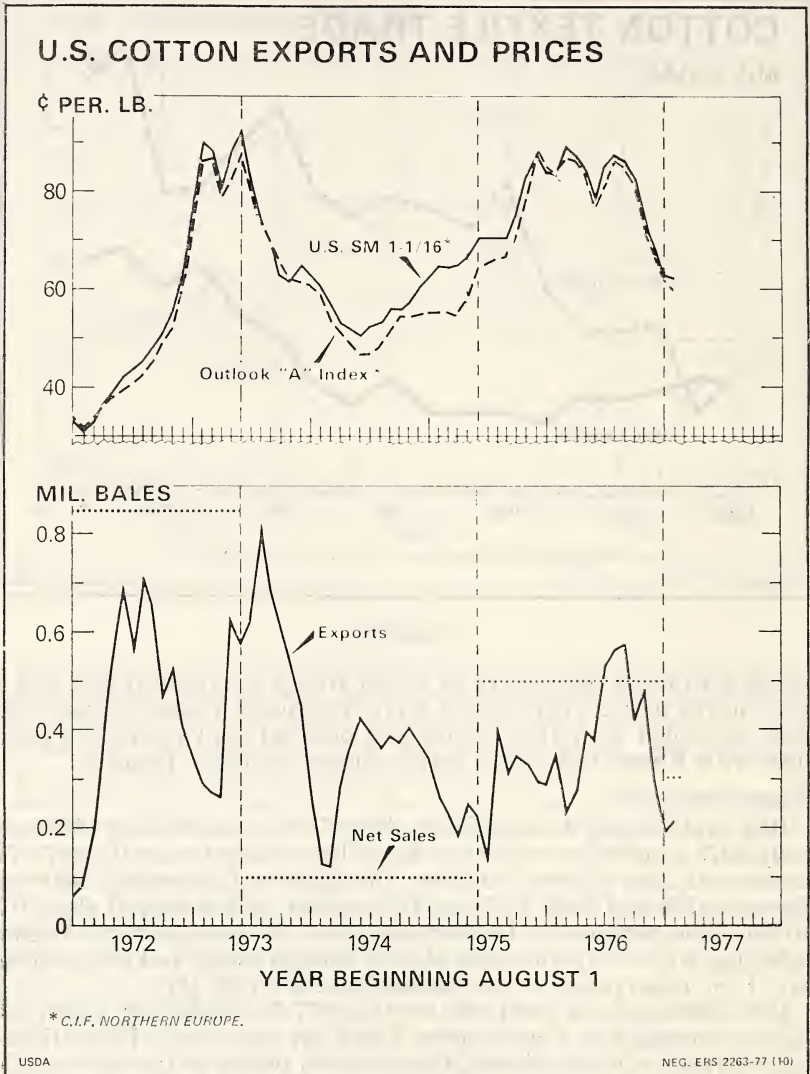


FIGURE 11

I think that these two scenarios pretty well bracket U.S. cotton export possibilities for this season. I come out somewhere around the middle of this range, or about $4\frac{1}{2}$ million bales. Of course, the east and gulf coast dock strike against container ships, which has had minimal impact on cotton exports so far, could reduce shipments if it should continue for several months or become more general.

Now let's shift our thinking to the outlook for next season. As I stated earlier, we can look for a larger U.S. cotton carryover next summer, probably in the range of $5\frac{1}{2}$ to 6 million bales. However, a smaller 1978 crop is a distinct possibility. On the demand side, I foresee moderately larger U.S. mill use along with perhaps slightly smaller exports.

Production prospects

The quantity of cotton produced in this country next year will depend on a number of factors, including the price of cotton relative to competing crops such as soybeans and grain sorghum, weather, and legislative program provisions. At this early date, it is difficult to predict commodity price relationships at planting time next spring and even more difficult to guess the weather. The new legislation even injects some uncertainty as to how farmers will make their planting decisions.

Just as Detroit has recently introduced its new 1978 model automobiles, a new-model farm bill has just rolled off the assembly line. It comes equipped with some of the same basic features as the 1973 model along with a few new-fangled gadgets designed to promote greater price stability. Congress has named this new vehicle, the "Food and Agriculture Act of 1977."

Under the 4-year upland cotton program, the national average loan rate for SLM $1\frac{1}{16}$ -inch cotton will be set at the lower of (1) 85 percent of the domestic price of such cotton during the 4 preceding marketing years or (2) 90 percent of the average adjusted price for the first 2 weeks of October of the 5 lowest quotes for SM $1\frac{1}{16}$ -inch cotton, c.i.f., northern Europe. For the 1978 crop, the loan rate has been set at 44 cents per pound based on the latter calculation, compared with 44.63 cents for the 1977 crop.

The program is designed to smooth out some of the peaks and valleys of future cotton price levels by adjusting raw cotton import quotas and the length of time producers are permitted to hold cotton in the CCC loan. For instance, when the average spot market price of SLM $1\frac{1}{16}$ -inch cotton is less than 130 percent of the average price of such cotton for the preceding 36 months, producers may request an 8-month extension to the present 10-month loan period. At other times, when prices are high, a special world import quota for a 21-day domestic mill supply of cotton will be opened up for 90 days. Based on recent daily rates of consumption, this quota would be slightly over 500,000 bales. Currently, the annual quota for upland cotton stapling less than $1\frac{1}{8}$ inches is 30,200 bales and has not been filled during most recent years.

The target price for upland cotton will be about 52 cents per pound for the 1978 crop, up from 47.8 cents for the 1977 crop. Thereafter, each year's target price will be based on the previous year's level and adjusted by changes in production costs per pound, excluding land and management. All program benefits will be tied to planted acres rather than the old allotment system.

The Secretary of Agriculture has the authority to require a maximum set-aside of cotton equal to 28 percent of planted acreage. For the

1978 crop, no decision has been reached although this matter is receiving close attention. The Secretary also is authorized to offer payments to farmers to divert cropland to conserving uses.

Total deficiency payments to upland cotton, wheat, and feed grain producers will be limited to \$40,000 per producer in 1978, \$45,000 in 1979, and \$50,000 in 1980 and 1981. Rice payments will be included in the limitation for 1980 and 1981. Total payments are currently limited to \$20,000 per producer.

The legislation provides for a disaster payment program for the 1978 and 1979 upland cotton crops. Disaster payments will not be subject to payment limitations as in past years.

So what about cotton production prospects for the 1978 crop? Let's talk first about acreage. Prices for both cotton and competing crops have declined since last spring with cotton experiencing the sharpest drop. Thus, if current price relationships prevail at planting time, acreage seeded to cotton next spring could drop considerably below this year's level. The big question surrounding 1978 acreage centers in Texas and Oklahoma, where about one-half the 1977 U.S. cotton crop was planted and where grain sorghum is the major competitor. Although sorghum prices also are relatively low now, the new program could affect the competitive position of cotton and sorghum in this area. The fact that the 1978 target price for sorghum will be based on its cost of production rather than on its relationship to corn will give sorghum a competitive edge. On the other hand, much will depend on set-aside requirements for the two crops. For example, a required set-aside for sorghum without one for cotton could discourage sorghum acreage. All in all, somewhat smaller cotton acreage in the Southwest is likely next spring.

Less cotton may also be planted in other regions. However, in the Far West, cotton acreage is expected to remain at a relatively high level if the water shortage does not worsen. Moving eastward, cotton acreage in the Delta may decline only slightly in view of the recent weakening in soybean prices, which have generally paralleled the decline in cotton prices. Also, cotton acreage in the Southeast may slip further if weather and insect problems continue to boost production costs. In summary, given current price relationships between cotton and competing crops, U.S. farmers may plant 11 to 13 million acres of cotton in 1978, compared with over 13.4 million in 1977.

Prospective 1978 cotton yields are another big uncertainty. Fickle weather during the past decade has caused yields to fluctuate from a low of 434 pounds per harvested acre in 1969 to a high of 520 pounds in 1973. This year, yields are averaging a relatively high 500 pounds per harvested acre. As illustrated in figure 12, if we assume 1978 planted acreage totals around 12 million acres, production next season could range from 10½ to 12 million bales, depending on yields. For instance, if yields should average around a bale per harvested acre, production would total a little over 11 million bales.

Disappearance prospects

Two factors will prove of paramount importance to U.S. mill use of cotton in 1978-79. General economic and textile activity will heavily influence the total fiber market, as will imports of textile products.

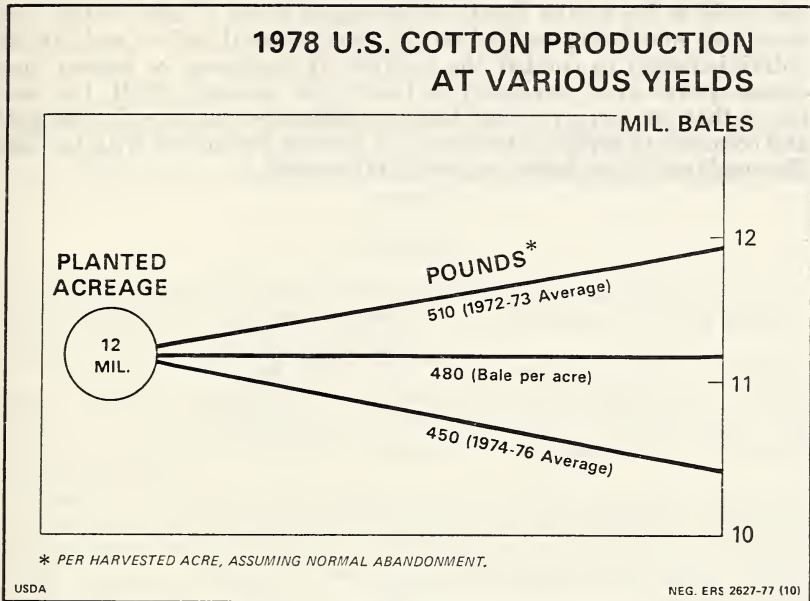


FIGURE 12

The second major factor will be the price competitiveness of U.S. cotton in domestic fiber markets. The recent decline in cotton prices has greatly improved its position relative to manmade fibers. This means that cotton use should be on the upswing as we enter the 1978-79 season. As a result, cotton use next season could total as much as 0.5 million bales above 1977-78's anticipated 6.7 million.

U.S. cotton export prospects for 1978-79 are not as bright as for the current season. Although foreign cotton consumption may again exceed production by 3 to 5 million bales, U.S. cotton will likely face increased competition from other exporting nations. As a result, foreign demand for U.S. cotton may not match this season's expected 4.4 million bales.

Despite smaller export prospects, however, U.S. disappearance could exceed production, meaning that stocks may fall slightly during 1978-79.

Over the longer run, I'm generally optimistic about the future of cotton. I believe that total fiber demand will continue to expand and cotton will share in this growth. Cotton has a vital role to play in satisfying future demand, whether it is for an all-cotton jean or towel, or a blended bedsheet or shirt.

All this is not to say that cotton's future will be void of problems. Despite international trade agreements, foreign produced textile goods will continue to be imported in large quantities. And manmade fiber producers will intensify their efforts to make further inroads into cotton's markets. Hopefully, the new legislation will promote more stable cotton prices, which would be a definite plus for cotton

in its competitive battle with manmade fibers. However, future cotton use could suffer at the hands of manmade fibers if new cotton dust standards now being readied by the Occupational Safety and Health Administration to combat the hazards of byssinosis or brown lung disease prove to be too costly to the textile industry. Still, I'm confident that we can overcome these problems as we have in the past and continue to supply American and foreign consumers with the best fiber and textile products produced in the world.



The graph illustrates the projected growth of the U.S. cotton textile industry from 1960 to 1980. The Y-axis represents 'Cotton Textile Spinning Spindles (Millions of Spindles)' and the X-axis represents 'Year'. Three lines are plotted: 'Total Spinning' (top line), 'Domestic Spinning' (middle line), and 'Foreign Spinning' (bottom line). All three lines show a steady upward trend, with 'Total Spinning' reaching approximately 10 million spindles by 1980, 'Domestic Spinning' reaching about 8 million, and 'Foreign Spinning' reaching about 2 million.

The data suggests a significant increase in total spinning capacity over the two-decade period, driven primarily by growth in domestic spinning. Foreign spinning also shows a consistent but slower increase, contributing to the overall expansion of the industry's capacity.

IMPACT OF NEW LEGISLATION: A FARMER'S OUTLOOK

(By C. Hoke Leggett, Chairman, Producer Steering Committee, National Cotton Council)

My assignment this afternoon is to discuss the implications of new cotton legislation, farmer's reaction to it, and then how that may influence cotton production next year.

You realize, of course, that while I serve as Chairman of the Producer Steering Committee of the National Cotton Council, and on the Council's Board of Directors as the producer director-at-large, my ability to see into the future is limited. My crystal ball, so to speak, is a little cloudy.

First of all, there are many aspects of the new legislation which are untried and untested, and which are going to be confusing to farmers. For example, cotton producers will hear for the first time of a "National Program Acreage", a "National Reduction Percentage" and an "Allocation Factor". For the first time in many years, he will not receive a notice of his farm allotment, nor will he know in all cases how many acres he can expect to plant and have eligible for price support payments. Payment limitations were increased from \$20,000 to \$40,000, and for the first time ever, payments which represent compensation for a disaster loss are not included in the total. For the first time ever, disaster payments may be paid on the total acreage of cotton planted on the farm, not just the farm allotment, but the payment is to be calculated at different rates and under different conditions of eligibility.

The CCC cotton loan for 1978, for the first time in history, has been computed on the basis of the current world price, and the loan rate has declined from 44.63 cents in 1977 to 44 cents for 1978. For the first time, under certain circumstances, the law provides for special import quotas and an option on the part of the producer to extend the CCC loan period from 10 to 18 months. For the first time in several years, farmers are faced with the possibility of set-aside acreage requirements. Cross-compliance between commodities as a condition of eligibility for loans or payments is brand new. New, stricter regulations make set-aside more expensive than formerly, possibly forcing some farmers entirely out of the set-aside crops into crops which have no set-aside.

Frankly, I'm afraid that the average farmer's reaction to the new cotton program will be one of utter confusion, unless the Department can carry a good information program to the farmer before planting time.

Let me give you a personal example. I produce cotton on my farm in North Carolina. Because of my involvement in the legislative process as an officer of the Producer Steering Committee, I am reasonably

knowledgeable about the new cotton program. But I also produce wheat, corn, soybeans, tobacco, and peanuts on my farm. Most of the grain is marketed through our own sow-hog operation. Like most farmers today, mine is a highly diversified business, so we are concerned not only about the provisions of law and the regulations which apply to cotton, but to the interrelationships which exist between the loan levels, set-aside requirements, and market prices of a variety of agricultural products. The market price of corn directly affects my cost of producing pork. A large set-aside in wheat and feed grains may cause a shift in acreage to soybeans or cotton, with a resulting pressure on prices of these commodities next fall. All of these are factors which I must consider at planting time next spring if I hope to maximize profits. And make no mistake about it, potential profit—the bottom line—will be the greatest influence on farmer's planting intentions from California to the Carolinas next year and every year.

To further compound the problem, we must recognize that while there are less than 90,000 active cotton producers left in the United States, they are scattered over 18 States. They have countless variations of weather conditions, water supply, insect populations, tillage requirements for wind and water erosion control, growing seasons, and on and on. Roughly the western half of the Cotton Belt is irrigated; cotton in the eastern half is rain grown.

There are very few comparisons one can make between the 50,000 acre cotton producer in the San Joaquin Valley of California, and a grower with 50 acres or less in Alabama. Yet each man represents a part of the system which is important to the industry, and each must have an understanding of the new program and its requirements before he can make an intelligent choice in 1978.

You see why my crystal ball is cloudy. With so many unknowns, how can anyone accurately predict a planted acreage 6 months from now? What will the price of cotton be next April, and how will that compare to the price of corn, or grain sorghum, or soybeans? How much will the price of fuel increase, to drive the tractors and the irrigation wells? Will a supply of insecticides be available that will control the bollworm-budworm complex? At what price? Will the Secretary's announcements of national program acreages in coming months affect prices?

I can't answer those questions. Five months from now, depending on the answers, I'll be in a better position to tell you how farmers will react at planting time.

Today, I can give you my reaction to what I hear farmers across the country saying. Cotton farmers, I believe, are generally pleased with the new bill. While opinions vary somewhat depending on geographical location, cost of production, and available alternative crops a farmer can plant, most producers believe the bill is about as good as could be had under the circumstances. Farmers were particularly pleased about the increase in the payment limitation from \$20,000 to \$40,000, the increased protection against disaster losses, and the option to extend the CCC loan to 18 months.

While very few if any of us expected the loan rate to drop to 44 cents in 1978, cotton leadership for the past several years has insisted

that the loan level should not interfere with U.S. cotton's competitiveness in world markets. We've seen a graphic demonstration this fall that this bill fully meets that test. The target price, at 52 cents per pound for 1978, is based on the cost of production, and most farmers believe that philosophy is sound. The new bill is designed to provide a more stable price structure, and to moderate violent fluctuations which have eroded cotton's markets in prior years. It allows the farmer freedom to plant, to adjust acreage up or down as the market dictates, and at the same time, offers a greater degree of protection from world price disruptions and adverse weather conditions. It establishes the loan strictly by formula, so that everybody can figure what it's going to be, thus eliminating any political influences.

Overall, Mr. Chairman, I believe it is a good bill, and I believe most farmers, if they understand it, agree with me. It would help, of course, if we could improve the price of cotton a few cents. With cotton selling below the average cost of production, cotton farmers are not going to be enthusiastic about any farm bill.

In summation, there are several significant changes in the farm bill that could affect cotton production next year—the level of the loan, the 8-month loan extension, set-aside requirements, disaster payments, a target price substantially higher than the loan, and higher payment limits.

In my judgement, however, comparative market prices next spring of cotton, soybeans, and grain sorghum, will be the major influence in the determination of cotton acreage next year.

U.S. OILSEEDS AND PRODUCTS OUTLOOK

(By George W. Kromer, Agricultural Economist, Economic Research Service, USDA)

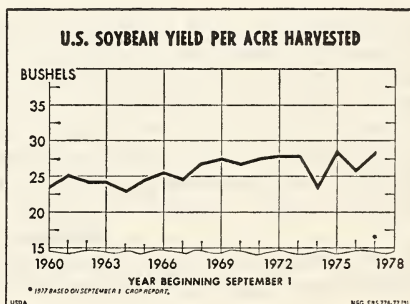
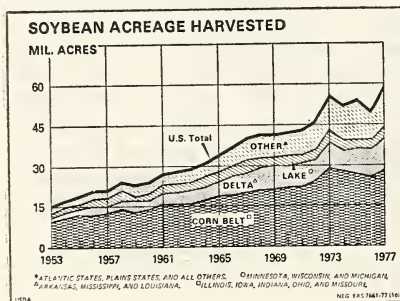
The 1978 outlook for U.S. oilseeds is highlighted by the record large supplies produced from this fall's harvest. Both domestic and export demand likely will increase, but not nearly as much as output. In early November, prices for most oilseeds, oils, and high-protein meals were below year-earlier levels but in contrast to the sharp rise which occurred last year, a much steadier price pattern is expected. Prices next spring and summer will be influenced by the prospects for 1978 oilseed crops, as well as international developments.

The United States harvested 76 million acres of oilseeds this year, 12 million more than in 1976. About three-fourths of the increase (9 million acres) were in soybeans with smaller gains in cottonseed, sunflowerseed, and flaxseed. Peanut acreage remained unchanged from last year's level. Total production for the 5 major U.S. oilseed crops is forecast at 53 million metric tons, 30 percent more than in 1976.

SOYBEAN SUPPLIES RECORD LARGE

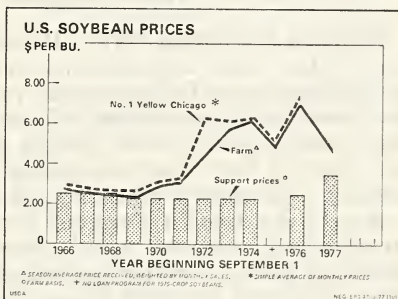
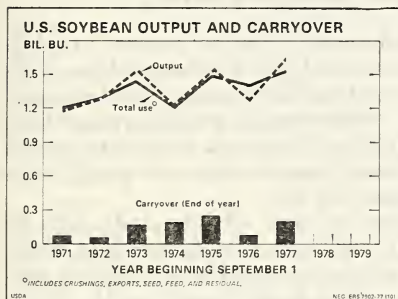
Increased acreage coupled with higher yields has resulted in record soybean production this year. As of October 1, the U.S. crop was estimated at 1,647 million bushels, up 30 percent from last year. And with carryover stocks last September 1 at 103 million, this pushes the total 1977-78 soybean supply to 1.75 billion bushels, up from 1.5 billion in 1976-77.

With record supplies and lower prices, soybean use is expected to expand to around 1.54 billion bushels, a tenth above last season. Both domestic crushings and exports are expected to increase, although not nearly as much as supply. Consequently, carryover stocks on September 1, 1978, are expected to exceed 200 million bushels, more than double this past September's low level.



HARVEST PRICES BELOW 1976

Reflecting increased supplies and lagging demand early in the season, prices received by soybean farmers in mid-October fell to \$4.83 per bushel, 34 cents below September and more than \$1 below October 1976. Prices have increased some since, due to the slower than normal harvest, a sharp pickup in domestic and export demand for soybeans, and the reduction in the Soviet grain crop. Some price strengthening may occur after harvest but much will depend upon farmers' willingness to store soybeans and/or place them under CCC loan, and on the competition from Brazil and other major world oilseed producers. Prices received by farmers for all of 1977-78 are forecast to average about \$2 below last year's \$7 season average.



The U.S. average loan rate for 1977-crop soybeans is \$3.50 per bushel. A large number of soybeans likely will be placed under CCC loan although actual deliveries to the CCC probably will be small. Producers use CCC loans as a source for relatively low financing costs.

CRUSHINGS TO INCREASE

Soybean crushings this season are expected to total around 850 million bushels, compared with the 790 million processed in 1976-77. This rise mainly reflects the prospective increase in soybean meal feeding due to lower prices and rising livestock/poultry production. The crush got off to a slow start in September-October but is expected to move well above year-earlier levels as meal demand expands.

A crush of this size would utilize only about two-thirds of the industry's 1977-78 processing capacity—now estimated at 1.25 billion bushels, up slightly from last season. While the industry also operated at two-thirds capacity in 1976-77, the long-term average utilization rate is 80 percent.

EXPORTS MAY REACH NEW HIGHS

Soybean exports in 1977-78 are projected at around 610 million bushels, compared with 564 million last season. Lower U.S. prices and increased meal demand overseas will provide the impetus for larger exports, despite increased competition from South American soybeans and meal. U.S. inspections for export from September 1 through October 28 totaled 74 million bushels, a shade below 1976. However, the

pace has picked up with a record high 25 million bushels moving out in the last week of October.

Increased overseas demand for protein meals is expected in both Western Europe and Japan as feeding of hogs and poultry continues to increase. Also, high feed grain prices in the EEC should encourage more liberal feeding of protein meals. Export projections assume that the U.S.S.R. will take around a million metric tons of U.S. soybeans, about as much as in 1976-77.

The United States will face stiffer competition in the world's oil-seed markets in 1978, with larger supplies of Canadian rapeseed, Soviet Union sunflowerseed, Indian peanuts, Malaysian palm oil, Peruvian fish meal, as well as more soybeans and products from South America.

1978 SOYBEAN ACREAGE MAY DECLINE SLIGHTLY

Soybean acreage in 1978 will be influenced by other factors in addition to the usual ones such as weather and price relationships with competing crops. Following the record planted acreage this year and the lower farm prices for 1977-crop soybeans, it would appear that acreage next year should decline slightly. However, with corn prices also sharply lower, soybean prices should remain attractive and competitive, perhaps at a price ratio of about $2\frac{1}{2}$ to 1.

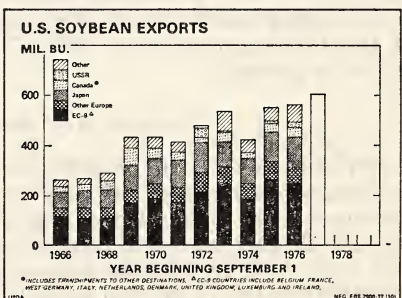
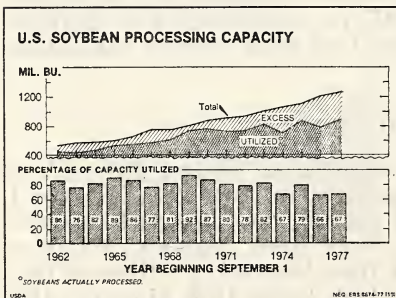
Also, the set-aside program for feed grains—if initiated—will be an additional element which farmers will need to factor into their cropping plans. Another important economic variable will be the soybean loan level for 1978. If the loan rate is raised significantly above the \$3.50 per bushel of this season, farmers may respond with increased acreage.

Nevertheless, with corn loan and target prices for 1978 at \$2 and \$2.10 per bushel, respectively, there may be only a slight shift in soybean acreage from the record 59 million acres planted this year. Soybeans could gain in the South at the expense of cotton but possibly would lose to corn in the north central area.

SOYBEAN OIL COMPETITION STIFFENS

U.S. soybean oil supplies in 1977-78 are expected to exceed 10 billion pounds, some 5 percent above last season.

Domestic use of soybean oil is expected to total around 7 $\frac{1}{2}$ billion pounds in 1977-78, up slightly from last year. However, soybean oil



will face increased competition from domestically produced cottonseed and sunflowerseed oils, as well as larger supplies of imported palm oil, and price spreads between these oils probably will be smaller than in 1976-77. Domestic use of soybean oil was off last season because high prices caused some consumers to limit purchases of food fat products while some food processors drew down inventories.

Soybean oil exports in 1977-78 are projected at around 1.4 billion pounds, down from the 1.55 billion shipped last season. The prospective decline mainly reflects reduced shipments to India because of that country's improved production of oilseeds this year. U.S. soybean oil will face stiff competition abroad because of increased world supplies of oils. Program activity for food aid is also a major factor in the level of U.S. exports of vegetable oils. More than one-third of the 1977-78 soybean oil exports is expected to move under P.L. 480 programs (titles I and II). About 412 million pounds (187,000 metric tons) of vegetable oils have been allocated under title I, P.L. 480, for 1977-78, mainly for Pakistan, India, and Bangladesh.

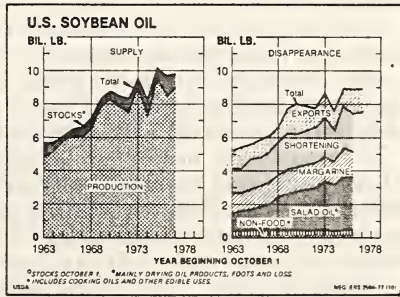
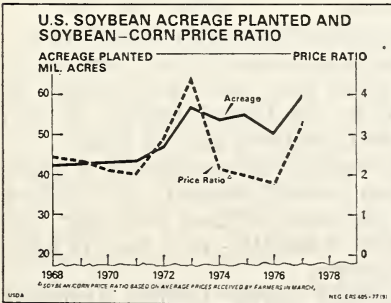
Soybean oil prices (crude, Decatur) fluctuated widely during 1976-77. Prices tended upward from 21 cents per pound early in the season to a peak of 31 cents in May. Prices then fell sharply during the summer and by season's end were about 19 cents.

Prices during the 1977-78 marketing year are expected to be relatively more stable than last season—possibly averaging near 18 cents per pound compared with a 24-cent average in 1976-77. Increased competition from other sources of vegetable oils both here and overseas will keep pressure on U.S. soybean oil prices. Prices in early November at 19 cents were 3 cents below year-ago levels.

SHARP EXPANSION IN SOYBEAN MEAL USE IN PROSPECT

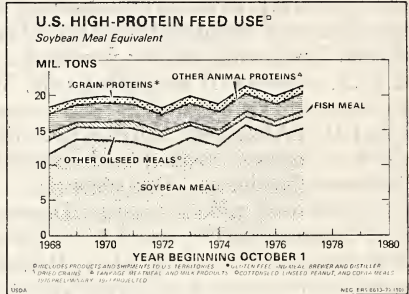
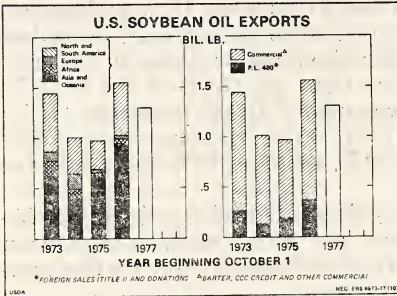
U.S. soybean meal supplies in 1977-78 probably will total around 20½ million short tons, compared with 19 million last year.

Domestic use of soybean meal is projected at around 15½ million tons, up more than 1 million from 1976-77. The increases in hog numbers (up 9 percent from a year ago), broiler production (up 6 percent), cattle on feed (up 6 percent), and small gains in milk and egg production (2 percent) all point to heavier consumption of high-protein feeds in 1977-78. In addition, feed use of corn and other grains is expected to increase some 6 percent, which will also stimulate the demand for



soybean meal. Furthermore, soybean meal will be more competitively priced relative to corn this year than last, based on relative feed values. This should lead to higher use of protein meals per animal unit.

Soybean meal exports are expected to increase slightly from the 4.6 million tons shipped in 1976-77. The bulk of U.S. soybean meal moving abroad is in the form of soybeans rather than the processed commodity. But Brazil is trying to export more soybean meal and oil while crushing more beans at home.



Increased supplies of soybeans and meal in 1977-78 are expected to result in meal prices averaging sharply below last season's \$200 per ton level—perhaps around the \$135 level. Soybean meal prices (44 percent protein, Decatur) during 1976-77 fluctuated widely, the monthly average varying between \$140 and \$273.

PALM OIL IMPORTS MAY INCREASE

U.S. palm oil imports may rise from last season's 661 million pounds to possibly around 800 million pounds. Continued expansion of Malaysia's palm oil production should put larger quantities on the world market. Their production for 1978 is projected at a record large 1.7 million metric tons against an estimated 1.5 million in 1977 and 1.3 million in 1976. U.S. imports in 1976-77 declined a fourth from the record of 933 million pounds the year before. Because of dry weather, 1977 production in Malaysia was not as large as expected. Also, other importing countries bought larger quantities. In addition, soybean oil prices were competitive with palm oil over most of the season—which discouraged U.S. palm oil imports.

This year, with larger domestic supplies of both soybean and cottonseed oil at lower prices, competitive price relationships may well be the major determinant affecting the level of U.S. palm oil imports. If Malaysia decides to export more oil to the United States, she can undersell soybean oil by a couple of cents and still show a profit.

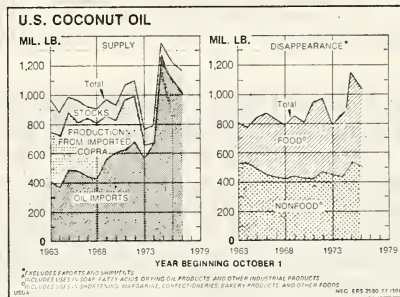
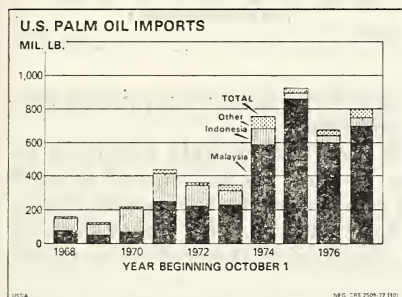
If imports are near expectations, domestic disappearance of palm oil may increase to about 750 million pounds, roughly 125 million above 1976-77. Over two-thirds of the total utilized last year was in the production of shortening. Smaller quantities were used in margarine and salad and cooking oil production.

Palm oil prices (c.i.f. U.S. ports, bulk) during 1976-77 averaged about 24 cents per pound, approximately the same as soybean oil prices.

They ranged from a low of 19½ cents to a high of 29 cents. Currently prices are quoted at about 20 cents and they should be more stable this year, reflecting larger world supplies of fats and oils.

COCONUT OIL IMPORTS MAY DECLINE

During 1977-78, U.S. imports of coconut oil may total around 1 billion pounds, down from last year, due to reduced output in the Philippines—the source of virtually all of our coconut oil.



Domestic disappearance last season totaled about 1.1 billion pounds, a tenth below the year before, reflecting reduced use in shortening, margarine, and other edible products. This season, disappearance may decline slightly as larger domestic supplies of food fats and oils tend to constrain use in these outlets.

Coconut oil prices (crude, Pacific Coast) averaged 28 cents per pound during 1976-77, up sharply from the 18 cents of the previous year. Prices rose from about 23 cents early in the season to around 37 cents in April, then weakened, and in early November were at the 24-cent level. With Philippine copra production expected to total near or below last year, coconut oil prices are expected to remain firm relative to other oils and fats prices.

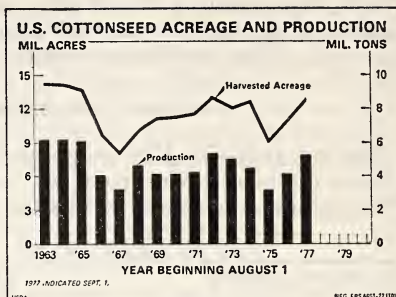
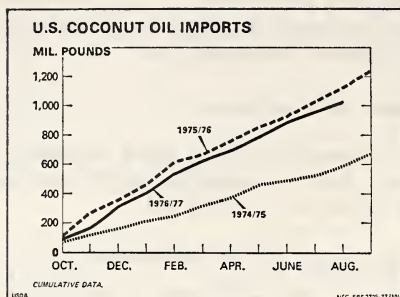
COTTONSEED OUTPUT LARGEST SINCE 1972

Due to large acreage and higher yields, the 1977 cottonseed crop totals an estimated 5.2 million short tons, a fourth above 1976 and the largest since 1972.

Cottonseed prices are down sharply, reflecting the large cottonseed supply coupled with generally weaker prices for most oilseeds. Prices received by farmers in August-October averaged \$76 per ton, about \$21 below a year ago. The combination of larger cottonseed supplies and increased supplies of vegetable oils and proteins likely will keep downward pressure on cottonseed prices.

Cottonseed oil supplies for the 1977-78 marketing year may total 1.7 billion pounds, roughly a third above last season and the largest since 1973-74. This buildup allows for an increase in both domestic disappearance and exports.

Domestic disappearance probably will total about 0.7 billion pounds, roughly 0.2 billion pounds above last year. Lower prices, along with the expanded supplies, should encourage usage. Nevertheless, cotton-



seed oil will face increased competition from larger supplies of soybean oil, sunflowerseed oil, palm oil, and lard.

Cottonseed oil exports, which have been surprisingly strong in recent years; may approach 0.7 billion pounds, an increase of about 6 percent. U.S. cottonseed oil enjoys a good market overseas, especially in Egypt, which is our major customer. However, with world supplies of fats and oils on the increase, cottonseed oil will also face increased competition abroad.

World production of cottonseed in 1978 may rise to 26 million metric tons, up 9 percent from this year. In addition to the increase from the United States, expanded production is expected in Mexico, Brazil, the U.S.S.R., the People's Republic of China, India, and Pakistan.

Domestic cottonseed oil prices (crude, Valley), which averaged 25 cents per pound in 1976-77, may be substantially lower this season. Prices skidded from a monthly average of 31 cents last May to 20 cents in September. At 20 cents in early November, cottonseed oil was priced about the same as soybean oil.

Cottonseed meal supplies for the 1977-78 marketing season total an estimated 2.3 million tons, roughly 40 percent above last year.

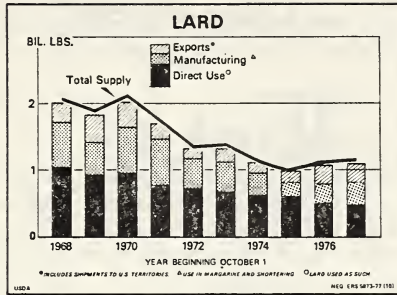
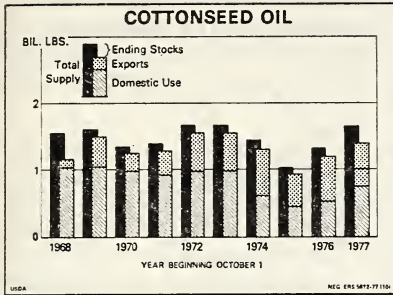
Domestic disappearance probably will exceed 2 million tons, up sharply from the 1.5 million of 1976-77. With the bulk of cottonseed meal used as dairy and beef cattle feed, lower meal prices and increasing livestock numbers, particularly cattle in feedlots, should serve to boost meal usage.

Cotton meal prices (41 percent protein, Memphis), which averaged \$185 per ton during 1976-77, should be substantially lower this year.

LARD OUTPUT POINTS UP

Lard production in the 1977-78 marketing year which began October 1 is expected to expand nearly a tenth from the 1.1 billion pounds of 1976-77, due mainly to increased hog slaughter. Slaughter, expected to run strong through most of the season, could be 7 to 8 percent above the previous year. Lard yields, which averaged 131½ pounds in 1976-77, may be off slightly again.

The 1.1 billion pounds of lard produced last year reversed a 2-year downtrend and the upward movement is continuing in this marketing year. The June-August 1977 pig crop was 7 percent above the same period a year ago. Sows farrowing during September-November are



expected to be up about a tenth. Farrowing intentions during December 1977–February 1978 are expected to be up 11 percent. Thus, hogs available for slaughter will exceed the previous year through most of the marketing season.

Domestic disappearance may increase slightly from the 0.8 billion pounds of last season, which was the lowest on record. While direct use of lard probably will decline, in line with the long-run downtrend, its use in margarine and shortening manufacture may increase if lard prices remain competitive with other major fats and oils.

Exports and shipments of lard may increase slightly from the 0.2 billion pounds of last year, and lower prices should help keep U.S. lard competitive.

The United Kingdom is a major outlet for U.S. lard; other large markets include Canada, Mexico, and various countries in South America.

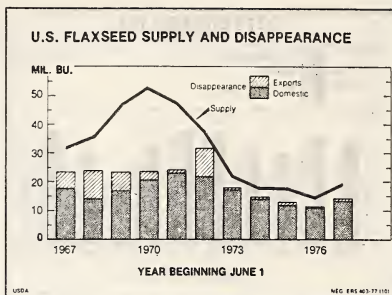
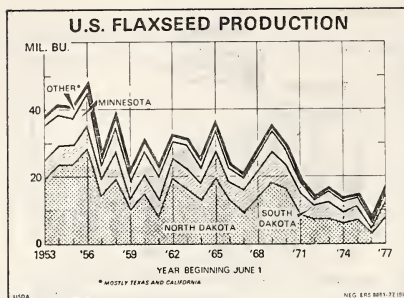
Last season, lard prices (tanks, loose, Chicago) averaged 21 cents per pound, ranging from 26 cents per pound last May to 19 cents in September. While prices this season likely will exhibit a more stable pattern, they will remain under pressure as production of fats and oils resumes momentum.

FLAXSEED PRODUCTION DOUBLES

The 1977 flaxseed crop is estimated at 16 million bushels, more than double the 1976 crop. Sharply expanded acreage and improved yields account for the increase. Acreage for harvest, at 1.5 million acres, is up over 50 percent. Roughly four-fifths of this acreage increase occurred in North Dakota. Yields per acre, at 11 bushels, are up over 3 bushels. With added carryover and imports, total supplies for the 1977–78 marketing year, which began June 1, are about 20 million bushels, a third above the small supply of the previous season.

Flaxseed crushings may total 12 to 13 million bushels, about a tenth above last year. Thus, sharply lower prices should encourage crush activity, which hit a record low last year. Although flaxseed crushings are in a long-term downtrend, in some years they reverse trend, especially when supplies expand and prices fall.

Flaxseed exports may increase slightly from the 0.2 million bushels of last season. However, competition from foreign flaxseed producers



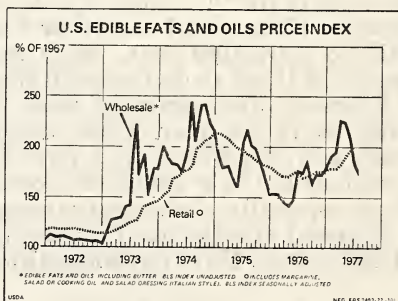
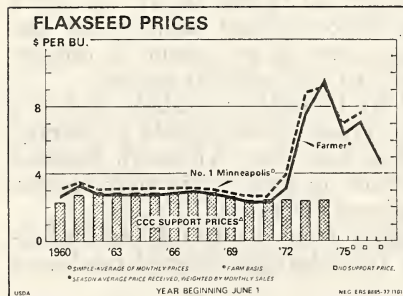
will be stiffer. Argentina's 1977 flaxseed crop, at 850,000 metric tons, is up about a third and the largest in more than a decade.

During June-October, prices received by farmers for their 1977-crop flaxseed averaged \$4.46 per bushel, about \$2.65 below the same period last year. Reflecting the larger supplies, as well as greater output for most major oilseeds, flaxseed prices declined from \$7.47 last April to \$3.71 in September. They have since increased but prices likely will remain under pressure this fall.

Linseed oil supplies for the 1977-78 marketing year total about 325 million pounds, up roughly a third from last season. With larger supplies and lower prices, domestic use of linseed oil may rise from last year's 164 million pounds. This assumes some shift by paint and varnish manufacturers into greater use of linseed oil, as this industry represents the largest single outlet for linseed oil.

Linseed oil exports may expand from last year's 14 million pounds, but the level will be influenced by world supplies of flaxseed and whether or not the U.S. price is competitive in world markets. Western Europe represents the major export outlet, but in some years the U.S.S.R. and Poland have purchased sizable quantities.

Linseed oil prices (raw, Minneapolis) this season have declined from 28 cents per pound last June to 20 cents in early November. In November 1976 prices were around 30 cents per pound. Similarly, linseed meal prices (34 percent protein, Minneapolis) dropped from \$176 per ton in June to about \$100 in September but have since strengthened to \$155 in early November, along with other high-protein feed prices.



Linseed meal supplies total 225,000 tons, up about a third from the previous year. Practically all of the increase is expected to be used domestically, which should boost domestic disappearance to near 0.2 million tons.

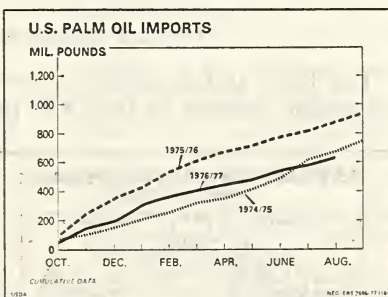
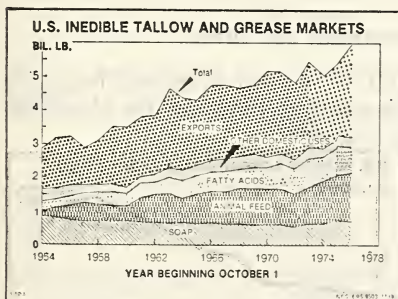
TALLOW OUTPUT HIGH

Inedible tallow and grease production in the 1977-78 marketing year, which began October 1, is estimated at about 6 billion pounds, roughly the same as last season's output. Although commercial cattle slaughter may dip a little, hog slaughter should be up sharply. With live weight of both cattle and hogs expected to be up or at least no less than last year, the net result should leave tallow production about unchanged.

Domestic disappearance is expected to expand slightly from the 3.2 billion pounds of last season. Disappearance last season was down about 4 percent from the previous year as use declined in all major outlets—soap, fatty acids, animal feeds, and lubricants. With prices averaging lower this season, domestic disappearance should pick up. Also, tallow exports may not be as strong this year, leaving more available for home use.

Exports may drop from the 2.8 billion of the previous year. Last year's export volume was up one-third, due to large requirements and relatively favorable tallow prices in relation to other fats and oils. Countries importing large quantities included the Netherlands, Egypt, Korea, Japan, the United Kingdom, and West Germany. With world production of fats and oils increasing, U.S. tallow exports may decline as countries utilize their own large crops or other economically competitive imports. Nevertheless, tallow prices are expected to be competitive with other fats and oils, which should keep exports at high levels.

Inedible tallow prices (bleachable, fancy, Chicago) during 1976-77 averaged 17 cents per pound, about 2 cents above the previous year. Prices declined from 20 cents last spring to an early November level of 17 cents. Prices likely will be more stable this season, given the larger world supply of fats and oils.



U.S. PEANUT SUPPLIES DOWN

The 1977 peanut crop is estimated at 3.4 billion pounds (farmers' stock basis), 10 percent below the 1976 output. Dry weather across

the peanut belt during the growing season and pest problems are primary factors behind the decrease, as acreage for harvest is down only slightly. The October 1 indicated yield per acre, at 2,238 pounds, is down 227 pounds from 1976. Production is down in all 3 major producing regions. With the smaller carryover, the 1977-78 peanut supply totals 4 billion pounds, down a fifth.

Use of peanuts in edible products during 1977-78 is projected to increase slightly from last season and may total 1.85 billion pounds. On a per capita basis this would be equivalent to about 8½ pounds. Peanut use per person has increased from around 6 pounds in the mid-1950's to the record level of nearly 9 pounds in the past few years. Use has increased in all major outlets such as peanut butter, salted peanuts, peanut candy, and roasted in-shell peanuts.

Peanut crushings will drop sharply from 1.1 billion pounds of last season. The August-September crush was 62 percent below the same 2 months in 1976. Smaller peanut supplies and continued good exports will keep crushings down. Crushings last year were the second largest on record, surpassed only by the 1.4 billion pounds of 1975-76, when CCC was toll-crushing peanuts.

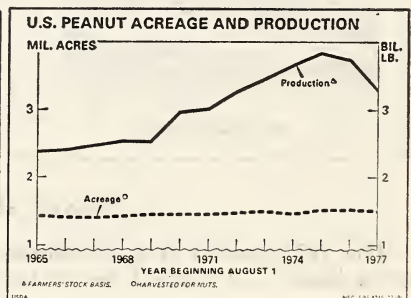
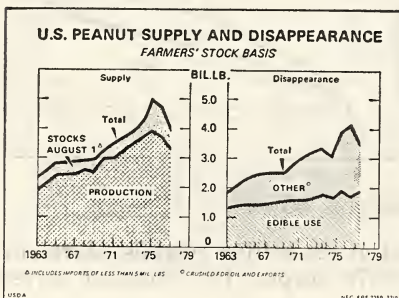
Peanut exports, which hit a record 0.8 billion pounds last season, also are expected to be sizable this year. However, they may not match the record as increasing world production of oilseed crops will provide stiffer competition. Peanut exports tend to fluctuate widely from year to year, and are influenced by world peanut output and other oilseed production.

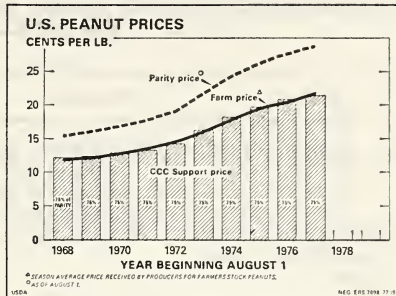
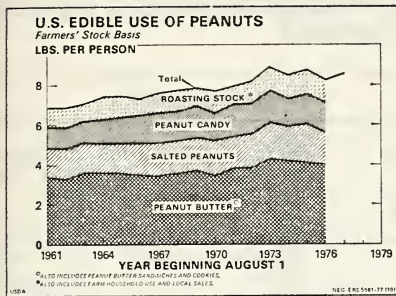
Despite smaller domestic output and expanded use, peanut supplies are still in excess of edible and farm use requirements. Thus, the Commodity Credit Corporation will likely acquire about a fifth of the crop under the price support program.

The 1977 peanut crop is being supported at a national average loan rate of \$430.50 per ton (21.5 cents per pound), an increase of \$16.50 over 1976. This rate, 75 percent of the August 1, 1977, parity price, is the minimum price support level for this year's peanut crop. Prices received by farmers during the 1977-78 marketing year probably will average around 21 cents per pound, about 1 cent above last season, and near the loan level.

PEANUT PROGRAM CHANGES IN 1978

The Food and Agriculture Act of 1977, signed in September, calls for major changes in the CCC price support program for the 1978-





crop peanuts. This is the first legislation since the Agricultural Act of 1949 to modify the peanut price support concept. Large supplies of peanuts in recent years and rising Government costs in carrying out price supports were major reasons behind the program change.

The new legislation retains some elements of the old program but introduces several new concepts. The target price concept, which is continued in the act for wheat, feed grains, rice, and cotton, is not extended to peanuts. Instead, the basis of the 1978-81 program is a poundage quota program, coupled with acreage allotments and two levels of price support. Producers will still need an allotment to grow and market peanuts.

On the following page appears a summary of the major provisions of the program expected in 1978 as compared with 1977, assuming peanut producers approve the continuation of marketing quotas in a referendum to be held before December 15, 1977.

An article entitled "The New Peanut Program" appears in the October 1977 issue of the *Fats and Oils Situation*, FOS-289, which presents in detail the basic provisions of the new legislation and describes how the program may operate.

Comparison of the 1977 peanut program with the program expected for 1978

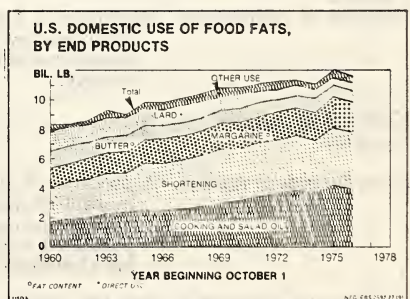
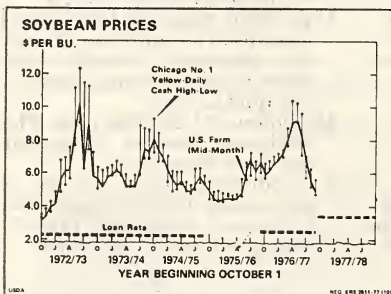
| Item | 1977 program | Expected 1978 program ¹ |
|-----------------------------|--|---|
| National acreage allotment. | 1,614,000 acres----- | 1,614,000 acre minimum, announcement before Dec. 1. |
| Transfer of allotments.. | Secretary of Agriculture allowed transfer within a county. | Legislation required that transfers within a county be allowed. An allotment transfer also shifts a proportionate share of the quota. |
| National poundage quota. | None----- | Minimum of 1,680,000 tons. The minimum declines 5 percent per year thereafter. |
| Farm poundage quotas.. | A producer may market as many peanuts as can be produced within his allotment. | A producer's quota will be a percentage of his average yield for the best 3 yr during 1973-77 multiplied by the allotment. |

¹ Assuming producers approve the retention of marketing quotas in a referendum and subject to decisions by the Secretary of Agriculture to be announced later.

Comparison of the 1977 peanut program with the program expected for 1978—Continued

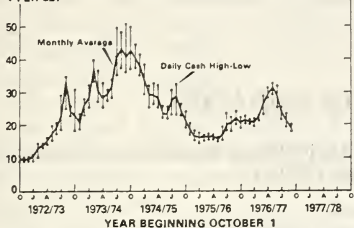
| Item | 1977 program | Expected 1978 program ¹ |
|--|---|---|
| Low yield provisions... | None, a low yield reduced the amount of peanuts marketed. | Undermarketings from quota may be added to the quota for next year. |
| Authority to produce "additional" peanuts. | Not applicable----- | Peanuts in excess of a producer's poundage quota but grown within his allotment may be marketed as "additional" peanuts. |
| Average price support level. | \$430.50 per ton (75 percent of parity) minus a \$20 per ton deduction for service charges. | Minimum of \$420 per ton on quota peanuts. Support on additional peanuts to be based on expected and crushing market conditions with the level announced by Feb. 15. Price support is no longer tied to parity. |
| Allowable uses of additional peanuts. | Not applicable----- | For crush or export. May also be used for domestic edible uses (food or seed) if marketed through the support program and purchased at a specified minimum price. |
| Production under contract. | No provisions for contract production. | "Additional" peanuts may be produced by allotment holders under contract for crush or export if the contract is submitted for approval before June 15. |
| Export of CCC peanuts. | Minimum price of 100 percent of support level plus costs to CCC. | Secretary of Agriculture will announce pricing provisions for CCC peanuts at a later date. |
| Disposition of surplus peanuts. | Sold for domestic crush through a bid procedure. | Secretary of Agriculture will announce pricing provisions for CCC peanuts at a later date. |

¹ Assuming producers approve the retention of marketing quotas in a referendum and subject to decisions by the Secretary of Agriculture to be announced later.



SOYBEAN OIL PRICES, CRUDE, DECATUR

¢ PER LB.

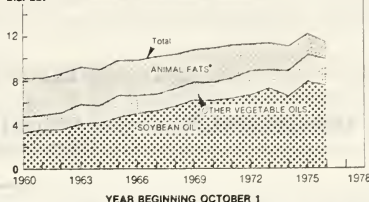


USDA

NEG. 493 (20-10-77-101)

U.S. DOMESTIC USE OF FOOD FATS,
BY PRIMARY FATS AND OILS

BIL. LB.

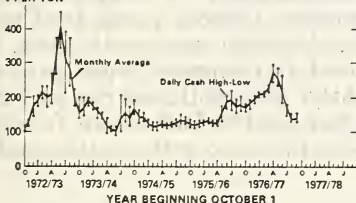


USDA

NEG. 495 (20-10-77-102)

SOYBEAN MEAL PRICES,
44% PROTEIN, DECATUR

\$ PER TON

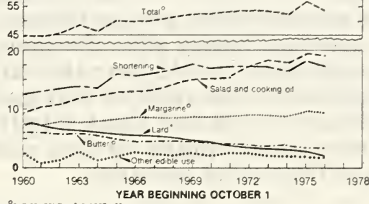


USDA

NEG. 493 (20-10-77-101)

U.S. CONSUMPTION OF FOOD FATS PER CAPITA,
BY END PRODUCTS

POUNDS



USDA

NEG. 494 (20-10-77-103)

RECENT SPEECHES, BULLETINS, AND ARTICLES AVAILABLE

Pertaining to Fats and Oils

A copy of the following releases may be obtained from the ERS Division of Information, Room 0054 South Building, U.S. Department of Agriculture, Washington, D.C. 20250.

"World Oil Sources and Trends in Consumption," by George W. Kromer, (202-447-8444). Speech before the Fifth Western Hemisphere Nutrition Congress, Quebec, P.Q., Canada, August 15, 1977.

"The World Peanut Situation and Prospects," by George Kromer, (202-447-8444). Speech at the 59th Annual Convention of the Southeastern Peanut Association, held at the Hyatt House, Birmingham, Alabama, June 20, 1977.

"U.S. Fats and Oils Statistics, 1961-76," Statistical Bulletin No. 574, June 1977, compiled by Ralph Mullins (202-447-8444). This bulletin incorporates in one book a comprehensive series of statistics on the U.S. fats and oils industry and complements the salient statistics appearing regularly in the *Fats and Oils Situation*, issued 4 times a year by the Economic Research Service.

"Forecasting Retail Margarine Prices," by Paul D. Velde (202-447-8776) and Stanley A. Gazelle (202-447-8444). *Fats and Oils Situation*, FOS-286, February 1977.

"Demand and Supply of Vegetable Oil Products in the United States: A Short-Run Analysis," by R. McFall Lamm, Jr. (202-447-8776). Presented at the Annual Meeting of the Southern Agricultural Economics Association, Atlanta, Georgia, February 6-9, 1977.

1978 OUTLOOK FOR TOBACCO

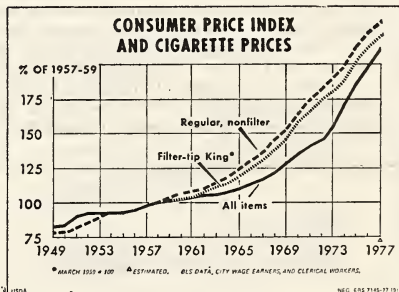
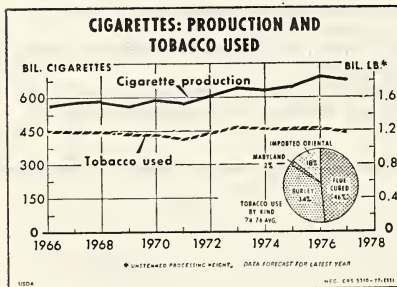
(By Robert H. Miller and Richard Hall, Agricultural Economists, Economic Research Service, USDA)

The tobacco outlook for 1978 is highlighted by a little uncertainty as USDA reviews the tobacco program for possible legislative recommendations. Unless marketing quotas are reduced, output will continue to exceed use. Prospects are for U.S. cigarette consumption to rise slightly from this year's record high level but our leaf exports are not likely to hold near recent levels. Despite the smaller U.S. crop this year, it about matches prospective use. The current tobacco quotas for Flue-cured and burley allow for more production than is currently used. If production is held near the current level and support prices gain as indicated, cash receipts may gain slightly. The continued rise in U.S. tobacco prices and short supply of better quality leaf means foreign buyers are stepping up their efforts to find tobacco with similar qualities from other countries.

CIGARETTES: KEY TO TOBACCO USE

Cigarettes continue to take four-fifths (1,117 million pounds) of the tobacco used in the United States and an even higher share of our unmanufactured tobacco and product exports. U.S. cigarette output should reach about 676 billion this year, about the average of the two previous years. Sales of low tar (less than 15 milligrams of tar) are rising to offset declines for cigarettes containing more tar.

As the smoking age population continues to increase, U.S. cigarette smokers may smoke a few more in total even though per capita cigarette consumption per person, 18 years and over, may decline slightly in 1977. In 1976, around 205 packs (4,110 cigarettes) per person were used.



Antismoking publicity and legislation continues to increase. For example, the American Cancer Society has scheduled a national "Smokeless Thursday" for November 17 to encourage smokers to quit. The cumulative effect on total smoking is uncertain although it could be more than marginal.

Wholesale cigarette prices, wholesale-retail margins, and retail prices edged higher in 1977. A 6-percent raise in wholesale prices in August, increasing wages for retail labor, and increasing State, county and municipal excise taxes meant a hike in cigarette prices above 4 percent for the year.

Four States raised excise taxes in 1977. Although the overall average increased only slightly, the higher taxes increased the price differentials among States. Excise taxes vary from 2 cents per pack (North Carolina) to 21 cents per pack (Connecticut, Florida, and Massachusetts) and 23 cents per pack (New York City). The wide differentials have led to a noticeably higher per capita sales in low-tax States and lower than average sales in most high-tax States.

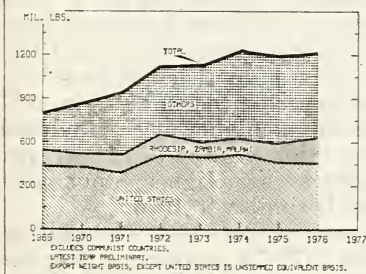
Consumption of large cigars in 1977 is totaling about 5 billion, 8 percent below 1976 and 45 percent below the 1964 peak. Also, small cigar output may fall one-fifth below the 2.5 billion total of 1976. Smoking tobacco output in 1977 is down 4 percent to an estimated 43 million pounds, a record low. The steady downtrend suggests younger smokers are not as attracted to cigars and pipes as in years past. Next year consumption may drop further.

Snuff output is remaining about the same. By contrast, chewing output probably reached 89 million pounds this year, 6 percent more than 1976's level. This overall gain may be associated with employment gains in mining, construction, and certain durable goods industries where smoking is either prohibited or inconvenient. Also chewing tobacco and snuff advertisements have appeared on television and radio.

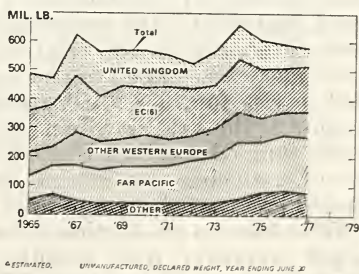
EXPORT VALUE MAY GAIN, VOLUME MAY NOT

The value of U.S. exports of tobacco and tobacco products in 1977 may gain from last calendar year's record high value of nearly \$1.5 billion. The October dock strike impacted on trade as exports were very high in the 3 months before the shutdown. Although the value

WORLD EXPORTS OF FLUE CURED TOBACCO



EXPORT MARKETS FOR U.S. TOBACCO



of both unmanufactured tobacco and tobacco products exports is expected to exceed last year's record highs, the strike may reduce volume to near last season. In recent years, leaf and product exports have taken about four-tenths of the U.S. tobacco crop. This year U.S. tobacco exports will register about a \$1.2 billion surplus over tobacco imports for consumption of about \$300 million. This favorable tobacco trade balance, along with strong sales of other agricultural products, is helping offset the country's trade deficit in nonagricultural products.

Unmanufactured tobacco exports in 1977 may not equal the 580 to 600 million pounds (645-660 million, farm-sales weight) shipped in recent years. Both rising production overseas and U.S. prices will hold down 1978 exports. Gains in world cigarette production have slowed to around 2-3 percent annually but the preference for light cigarettes containing Flue-cured and burley tobaccos continues. In our major market, the European Community, takings of U.S. tobacco are ahead of 1976. More is going to West Germany and Italy. However, purchases by Japan and the United Kingdom have been down.

World tobacco output this year may total below the 11.9 billion pounds produced in 1976, chiefly because output in the United States is down. Both Flue-cured and burley production abroad continue to rise relative to the United States as foreign use of these tobaccos increases.

Imports accounted for about 21 percent of U.S. manufacturers' tobacco utilization last marketing year (17 percent of use for cigarettes and 80 percent for cigars). Oriental cigarette leaf is the principal kind imported. Cigarette tobacco imports for factory use this year may decline to around 210 million pounds. This quantity includes 25 million pounds of scrap and about 20 million pounds of Flue-cured and burley leaf.

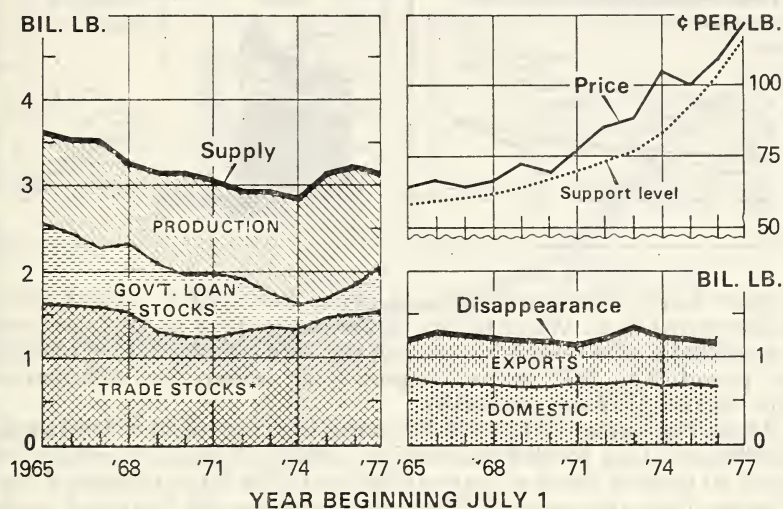
Cigar tobacco imports are mainly filler tobacco, including scrap. For this year imports will probably total 85 million pounds for consumption, slightly higher than a year earlier. High cigar tobacco imports will probably continue due to requirements for low cost, neutral tobacco for blending, and shortages of certain grades and qualities in domestic tobaccos.

LEAF PRODUCTION MAY REMAIN RESTRICTED

The most notable developments for U.S. producers in 1977 were drought-reduced production, a continuation of the upward price trend, and the USDA review of the tobacco program. Despite a slowdown in utilization and relatively high loan holdings, prices at Flue-cured auctions jumped to new records. Price support levels are scheduled to rise for 1978. Cash receipts are expected to total less in 1977 because of the smaller volume more than offsets higher prices. Reduced yields jumped specified Flue-cured production costs 11 to 12 cents per pound, reducing net income in drought areas. Higher input costs pushed costs up about 5 percent for yields similar to 1976.

Total tobacco production is down 11 percent this season. Adding the larger carryover, total supplies for the 1977-78 marketing year are about the same as last year. With brisk auction bidding and higher

FLUE-CURED TOBACCO: SUPPLY, PRICE, USE

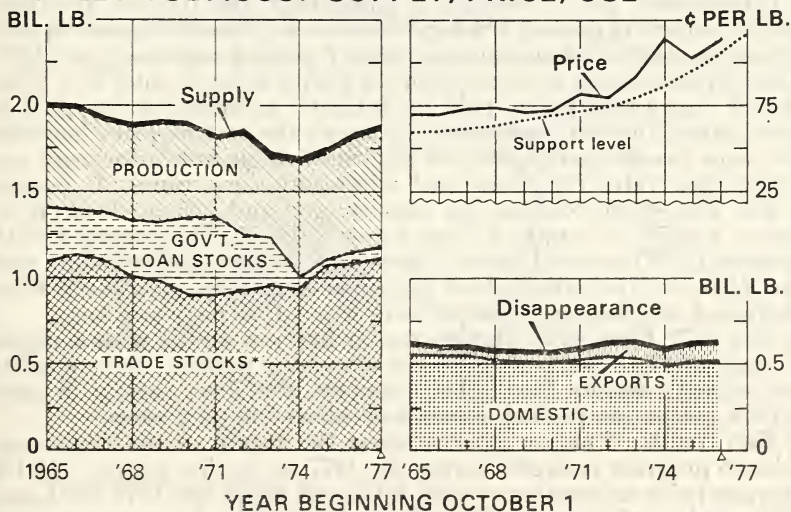


* MANUFACTURERS' AND DEALERS'

USDA

NEG. ERS 223-77 (9)

BURLEY TOBACCO: SUPPLY, PRICE, USE

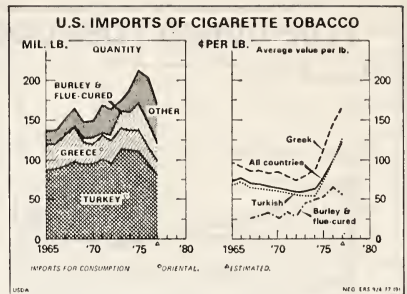
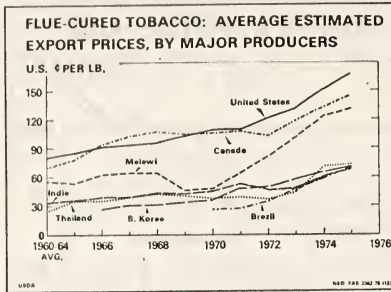


* MANUFACTURERS' AND DEALERS'

△ ESTIMATED

USDA

NEG. ERS 381-77 (9)



support levels, Flue-cured tobacco prices averaged 8 percent above 1976's record level. When burley markets open next week, prices may rise and set a new record, surpassing the 1976 season's record of \$1.14 per pound. The 1977 burley support level exceeds the 1976 market price and the 1977 crop is smaller.

At the beginning of the 1977-78 marketing year tobacco held under Government loan totaled 632 million pounds (farm-sales weight) or about 60 percent above a year earlier level. The large volume of loan tobacco from this season's Flue-cured crop has not increased stocks substantially because of increased sales of previous crop held in loan stocks. But most of the old crop loan stocks are the less desirable, low stalk tobacco. It appears that it will be difficult for the Stabilization Cooperative to recover the loan value of this tobacco.

Government price support is mandatory for tobacco produced under marketing quotas. The legal formula requires that price support levels for eligible tobaccos go up about 7 percent next year over 1977. The increase results from a rise in the parity index—which is a measure of changes in prices paid by farmers, including wages paid to hired labor, interest, and taxes. Although the rate of price increases for some production inputs has slackened, high costs of energy and rising lease rates for Flue-cured allotments are a cause of concern.

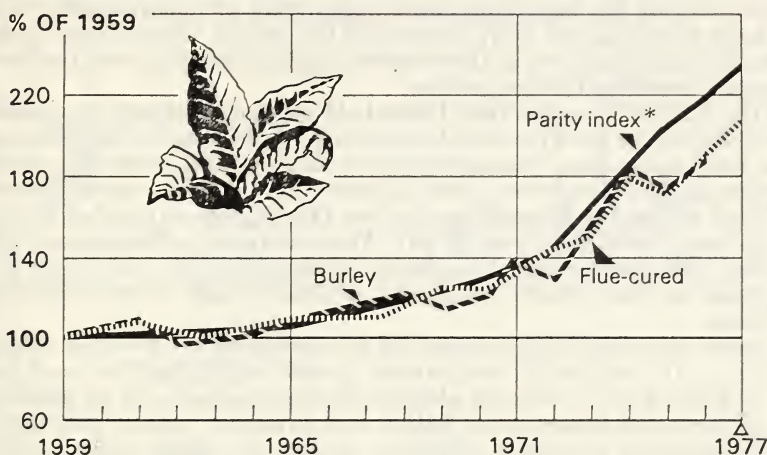
For Flue-cured tobacco, the smaller crop and increased carryover means a 1977-78 supply a little below 1976-77. This season USDA lowered the Flue-cured quota 12 percent to bring supplies in line with use. Growers are selling about 15 percent less than in 1976. Acreage decreased and average yield per acre was cut by poor weather.

The 1977 Flue-cured auction season has just ended with a record average of \$1.18 per pound, 8 cents above the previous year. Quality was mixed; despite the higher supports, the short supply in some export categories pushed prices way above support rates.

Two trends of major concern about the future of the Flue-cured tobacco program emerged during the 1977 marketing season: (1) the average price set another record, 8 percent above the 1976 level, and (2) supplies of upper stalk leaf usually bought by exporters were reduced by poor weather and the smaller acreage.

Both early and late in the season, prices averaged below the previous year as less desirable lower stalk and lower quality tobacco accounted

TOBACCO PRICES AND PARITY INDEX

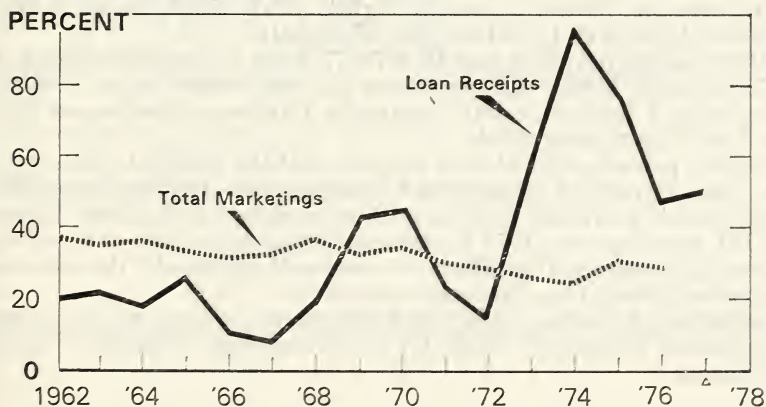


* PRICES PAID FOR ALL ITEMS INCLUDING INTEREST, TAXES, AND WAGE RATES.
 ▲ SEPTEMBER 1 INDICATIONS

USDA

NEG. ERS 762-77 (9)

X, P, & N GRADES* AS A SHARE OF U.S. FLUE-CURED TOBACCO



* LUGS, PRIMINGS, AND NONDESCRIPT. ▲ PRELIMINARY.

USDA

NEG. ERS 2598-77 : 10

for a large percentage of marketings. By contrast, September prices reached \$1.31 per pound to exceed the 1976 price by 13 cents. At that time, most of the marketings were upper stalk or export quality leaf. A high percentage of early season and late season tobacco went under loan in contrast to very little when the market offerings were leaf, cutters, and smoking tobacco grades.

The USDA Tobacco Task Force held seven hearings in September and October in the Flue-cured producing States. Growers emphasized the need to continue the present price support and marketing quota programs. Differing views were expressed on the effects on utilization of high and rising costs on production. Other growers emphasized the high lease rates they have to pay. Many industry officials were concerned with the continued escalation in support levels and rising proportion of loan stocks consisting of lower stalk (lower quality) tobacco.

Some lower stalk tobacco graded as containing sand or dirt sold as much as 10 cents below comparable grades containing less sand and dirt. Thus, there is concern about how the program may be modified to obtain more tobacco now selling at a premium without producing and marketing a greater volume of tobacco for which there is little demand.

For 1978, under the acreage-poundage program, USDA is required to announce the national Flue-cured marketing quota by December 1, 1977. The 1977 quota was 1,116 million pounds, or 3 percent below the previous seasons' use. Supplies are about 2.8 year's use compared with the desired supply of 2.5 years, according to the legislative formula.

The 1977-78 supply of burley tobacco is 2 percent above last season. Carryover on October 1 was up slightly. This year's crop is down 6 percent. Acreage and yield are both off slightly.

Burley disappearance rose in 1976-77 when exports rebounded. In 1978 domestic burley disappearance may gain with larger available supplies and further growth in exports. Carryover stocks next October 1 will likely change little.

Burley poundage legislation requires that the national quota be not less than 95 percent of estimated disappearance for that year. With disappearance around the 610 million pounds for the past 3 years, USDA may keep the 1978 burley marketing quota near this season's 636 million pounds. The 1978 farm quota will increase by the indicated undermarketings from this year's quotas.

Supplies of Southern Maryland are about the same as last season. Supplies of Fire-cured, Dark Air-cured, and cigar tobacco are larger this season.

NOTES ON WORLD TOBACCO OUTLOOK

(By B. C. Andrews, Director, Tobacco Division, Foreign Commodity Analysis,
Foreign Agricultural Service, USDA)

The world market for tobacco has been growing on a long-time upward trend. Foreign production, trade and consumption particularly for Flue-cured and burley types have been rising at a rather rapid rate.

The world tobacco crop reached a new record in 1976 and cigarette consumption rose to new high levels even though the pace was slower than most recent years.

Supplies of tobacco in most areas or available from traditional sources appeared adequate to meet anticipated requirements even though there was developing an indicated tight supply situation in quality Flue-cured tobacco sufficient to meet the rising demand. Prices in world markets were rising rapidly.

In the past year there appeared some slackening in the growth of demand for tobacco with slower rates of increase in cigarette output particularly in developed countries. Higher prices for cigarettes due to rising costs and increased taxes and intensified antismoking efforts have tempered the market expansion in a number of major consuming countries.

Cigarette output may continue to trend upward in the next few years at least in line with the population increase but actual tobacco requirements for usage in cigarettes is expected to lag behind the consumption growth rate as manufacturers continue to improve efficiencies in utilization of leaf tobacco.

Global production of tobacco in 1977 for Flue-cured and burley types is preliminarily indicated down from the high level of the previous years. Flue-cured is indicated to be down over 120,000 tons with the major reduction in the United States and Rhodesian crops. On the other hand, larger crops are indicated for Brazil, India, Korea, Pakistan, South Africa, and Japan but not sufficient to offset the reduction in the U.S. crop.

World burley production is also indicated down with a reduction in the United States partially offset by small increases in Italy, Korea, and Brazil. Even though U.S. burley exports have reached a new record level, the U.S. burley share of the world market continues to decline.

World trade is also being affected by the slackening growth in demand for tobacco products. Manufacturers in a number of major importing countries have drawn on stocks rather than increase purchases. Although world imports for consumption may not have indicated net change in total volume, the pattern of imports has significantly changed reflecting a shift to lower cost and milder types of cigarette leaf from foreign suppliers. Imports into the United States

also dropped slightly in the past year reversing the upward trend of recent years. However, with increasing supplies of foreign grown tobaccos, and reduced U.S. supplies at higher prices, U.S. imports are expected to return to the long-time upward trend.

U.S. tobacco exports are expected to be down in fiscal year 1978 compared to the relatively high level of the past year. Heavier shipments in the fourth quarter of the past year, primarily as a result of exporters anticipation of the dock workers strike, boosted the year's export movement about 9 percent above the reduced level of a year ago. Because of reduced Flue-cured crop in 1977, which was significantly lower in quality and with foreign buyers resistance to the higher prices, exports in 1978 will be down. The reduced supplies of export grades and sharply higher prices caused some foreign buyers to significantly curtail purchases from the 1977 U.S. Flue-cured crop. Moreover, Government assistance programs for Public Law 480 shipments may be substantially reduced in the current year.

Based on the current analyses, U.S. unmanufactured tobacco exports (including bulk smoking tobacco) during fiscal year 1977 totaled 296,000 tons and were valued at \$1.1 billion. This carryover with 273,000 tons valued at \$929 million the preceding year. Cigarette exports in the past year were 68 billion pieces for a value of nearly \$613 million representing a growth of 16 percent in quantity and 29 percent in value. In the previous year cigarette exports were valued at \$474 million with a total of all manufactured products exports at about \$500 million.

Fiscal 1978 U.S. tobacco exports are forecast at about 250,000 tons valued at \$984 million, both down substantially from the preceding year. Leaf tobacco exports will tend to be depressed for the duration of the longshoremen's strike because almost all tobacco moves through east coast ports and a significant part of the exports are containerized. A portion of the leaf that moved during the last quarter of fiscal 1977 would normally have moved in the first quarter of fiscal 1978. The distorted trade patterns caused by the current strike are partially responsible for the pessimistic 1978 outlook; however, the primary reason is foreign buyer resistance to the higher prices and lower quality of the 1977 Flue-cured crop.

The size of the U.S. Flue-cured crop currently being sold is 17 percent below 1976 and is reported to be significantly lower in quality. The drop in output resulted from a 12-percent quota reduction combined with a severe drought during the growing season. Supplies of upper stalk leaf grades, normally desired by exporters, were proportionally even smaller than the total crop. The reduced supplies of the export grades and resulting sharply higher prices caused many foreign buyers to sharply curtail purchases.

The Japanese Tobacco Corp., the largest leaf customer in fiscal 1977, is expected to reduce shipments in the current fiscal year by an estimated 5 percent to 44,000 tons. Poor quality and higher prices were given as reasons for the reduction. West German buyers cite higher prices, a shortage of desirable grades and a slump in domestic cigarette sales as reasons for a projected 10- to 15-percent decline in purchases in fiscal 1978. The same reasons were quoted by most major buyers who all project lower shipments in fiscal 1978.

On October 4, U.S. Agricultural attachés in several leading markets for U.S. tobacco were requested to contact major users of U.S. leaf in their countries to ascertain anticipated purchases of U.S. tobacco in the current and subsequent years. A summary of the replies received from major markets was:

West Germany.—(1976 imports from the United States, 42,800 tons, \$139.7 million): Substantial reduction in purchases from 1977 crop due to high prices and shortage of desirable upstalk grades as well as slump in West German cigarette sales. Continuation of cuts in use of U.S. leaf for 1978 and subsequent crops if pattern of high prices, short supply of desirable grades, and questionable quality continues.

United Kingdom.—(1976 imports from the United States, 35,200 tons, \$123 million): Purchases from 1977 crop are down because of high prices and very short supply of suitable quality leaf. Considerably larger purchases from 1978 crop if right quantities and qualities of leaf available and if prices moderate. No reductions in purchases from subsequent crops if "prices and supplies are right" and depending on impact of internal policies on U.K. consumption. But return to pre-1977 price levels will not lead to substantial increases in usage of U.S. leaf once blends are changed.

Netherlands.—(1976 imports from the United States, 12,400 tons, \$37.7 million): Large cut in 1977 purchases due to high prices and low quality. High U.S. prices are forcing reduction in stocks and use of U.S. leaf. Purchases in 1978 and 1979 will depend on price, quality, and availability, but will not return to U.S. tobacco once blends are changed.

Denmark.—(1976 imports from the United States, 3,300 tons, \$11.3 million): Foresee drastic reduction in U.S. imports unless price and supply situation changes. EC tariff structure also hurting U.S. leaf imports. Imports in 1977, 1978, 1979 estimated to average 5,000 tons based on purchases already made in 1975, 1976, 1977; but if 1977 crop price/supply situation continues in subsequent years, purchases for import in 1980 will be cut to 3,000 tons.

Ireland.—(1976 imports from the United States, 3,300 tons, \$10.9 million): Largest user confirms difficulty purchasing usual requirements of U.S. leaf due to price/quality/supply problems with 1977 crop. Other main users say poor quality and high price of U.S. crop is forcing cut in purchase to absolute minimum. Return to "normal" purchases will depend on price, availability and quality of U.S. crop in subsequent years.

Belgium.—(1976 imports from the United States, 7,400 tons, \$23 million): Serious concern over continuing high U.S. prices and decline in domestic cigarette consumption. Mixed pattern of purchases from 1977 U.S. crop—one major user cut purchases more than 50 percent due to price; others maintained or increased U.S. purchases.

None plan to increase 1978 purchases above 1977 level and cuts likely if U.S. prices do not moderate. Unwilling project purchases past 1978 due to price and demand uncertainties.

Switzerland.—(1976 imports from the United States, 11,600 tons, \$35.4 million): Present U.S. market is "close to a disaster"—virtually impossible to purchase quality of leaf needed at any price. If present prices for top quality export grades continue into 1978 crop, 20 per-

cent reduction in purchases foreseen with further reductions "very probable" in subsequent years.

Thailand.—(1976 imports from the United States, 6,900 tons, \$25.3 million) : Purchases in 1977 estimated 8,100 tons; 1978—8,600 to 9,000 tons. Consumption growth rate forecast 8 to 10 percent over next few years; growth rate for imports U.S. leaf forecast 5 percent.

Philippines.—(1976 imports from the United States, 6,000 tons, \$25.8 million) : Estimated imports U.S. leaf 1977—7,150 tons; 1978—8,500 tons; 1979—8,000 tons; 1980—9,200 tons. Flue-cured makes up 70 percent of U.S. imports, balance largely burley.

Sweden.—(1976 imports from the United States, 7,500 tons, \$22.8 million) : Normally buys about 3,000 tons per year. Purchases to date for 1977 crop total 1,000 tons; additional 2,000 tons will be bought if quality and price do not prevent. Plans to buy 2,800 to 3,000 tons from 1978 crop if price and quality are gone, but could buy more if U.S. leaf is relatively better value than competing leaf. Will continue to use high proportion of U.S. leaf for quality reasons, but use, once reduced, could remain at lower level if products are acceptable to consumers.

The future for U.S. tobacco in world markets is uncertain. Continuation of present trends indicate further erosion of the U.S. share in world trade. Mounting pressures against the U.S. tobacco industry and tobacco programs make it increasingly difficult to project the future. Unless the United States is able to make additional supplies of acceptable tobacco in more selective grades and qualities at more competitive prices available for foreign purchasers to meet their requirements, the U.S. share of world trade will continue to erode. Consistent reductions in quotas at higher prices will not maintain exports.

U.S. GRAIN SITUATION

(By James J. Naive, Agricultural Economist, Economic Research Service, USDA)

TOTAL GRAINS ¹

Beginning stocks of all grains for the 1977-78 marketing years at 62 million metric tons were two-thirds larger than a year earlier and the largest since 1972-73. U.S. growers in 1977 harvested a record 261 million metric tons, up slightly from last year's record. Each of the feed grain crops yielded larger harvests, although the corn crop was the only record. On the other hand, the wheat and rice harvests were down in 1977. These developments resulted in a record large 1977-78 grain supply of 323 million.

U.S. grain export prospects are much improved over earlier expectations for as the season progressed the outlook for 1977 world grain crops dimmed, particularly in the Soviet Union and the Southern Hemisphere. Projected exports for the 1977-78 marketing year total 83 million metric tons, 5 percent above last year and only a little below the 1975-76 record.

With most sectors of the feeding industry going into the new year in full tilt, domestic use of grains in 1977-78 may increase around 7 percent which would still fall far short of the levels of the early seventies.

Feed use uncertainties

Apparent feed use during 1976-77 turned out well below our expectations, raising more than usual speculation over 1977-78 forecasts.² Last year at this time our analysis indicated that concentrate feeding might be up around 7 percent with feed grains 5 percent higher (corn pegged at 3.8 billion bushels), wheat feeding 4 times larger, and oilseed meal down 8 percent.

Instead, the accounts show that concentrate feeding was unchanged with feed grains actually off 4 percent (corn was 3.5 billion bushels), but wheat feeding was up four times and oilseed meal was off 8 percent. These developments occurred when there was production increases of 15 percent for pork, 4 percent for broilers, 4 percent for fed beef, and 3 percent for milk. At the same time, roughage supplies were the tightest in years, and the winter one of the severest on record. Both of these situations would point to increased requirements for grain feeding.

¹ Data for sorghum, oats, barley, wheat, rye, and rice (rough equivalent) are aggregated on the basis of respective marketing years.

² For a discussion of forecasting methods see "Quarterly Feed Demand for Corn" Robert Butell and Abner Womack, ERS-649, February 1977, and "The U.S. Demand for Corn, Sorghum, Oats and Barley: An Econometric Analysis," Abner Womack, Department of Agriculture and Applied Economics, University of Minn., August 1976.

FOOD AND FEED GRAINS ¹

[In million metric tons]

| Item | 1975-76 | 1976-77 | Estimate, 1977-78 | Probable variance ² |
|-----------------------|---------|---------|----------------------|-----------------------------------|
| Beginning stocks..... | 27.5 | 37.1 | 61.9 | |
| Production..... | 248.7 | 256.8 | 261.5 | +5 to -5. |
| Imports..... | .6 | .4 | .4 | |
| Total supply..... | 276.8 | 294.3 | 323.8 | |
| Feed use..... | (118.2) | (115.0) | (125.3) | |
| Domestic use..... | 155.1 | 152.6 | 163.5 | +8 to -8. |
| Exports..... | 84.5 | 79.5 | 83.4 | +5 to -5. |
| Total use..... | 239.6 | 232.1 | 246.9 | |
| Ending stocks..... | 37.0 | 61.9 | 76.9 | +10 to -10. |

¹ Summary of marketing year data for wheat, rye, rice (rough), and feed grains.² See footnotes on grain tables in this report.

In retrospect, there appears to be several factors that count for at least part of this apparent anomaly:

- The residual estimate. Feed use is not reported directly but is a residual after taking all other supply and disappearance items into account. If statistical or estimating errors were accumulating rather than offsetting, the residual would differ substantially from actual feed use.
- Reduced feeding rates. Slaughter weights were lighter for barrows and gilts while placement weights for feeder cattle were heavier.
- Monesin. This feed additive which improves the efficacy of feed conversion in cattle was apparently widely adopted by cattle feeders in 1977-78.

Apparent grain feeding during June-September was up about 15 percent which might be an indication that it was back on track. We are forecasting feed uses higher in 1977-78—all concentrates up 5 percent; feed grains, oilseed meal 6 and 11 percent higher, but wheat feeding off 15 percent. These forecasts take into account:

- Substantial increases for pork and broiler production.
- Modest production increases for fed beef, milk, and eggs.
- Improved roughage supplies.
- A possible squeeze on feeding margins later in the season that could reduce feeding rates.

Although total disappearance is expected to be up significantly, there still is likely to be some stock building during the season. We are estimating U.S. stocks could rise to the highest levels since the midsixties. Associated with these prospects are the low prices experienced this summer and fall when levels were the lowest in 4 or 5 years. But prices have strengthened significantly and will likely rise further as the season progresses. The season is likely to end with prices running at their highs contrary to the patterns of last year. Factors that will influence the level and pattern of prices include:

- Foreign purchases. To date, export commitments (shipments plus outstanding sales) for the 1977-78 marketing year are well below this time in recent years. Rice with sharply larger commitments is an exception.

- Growers' inventory management. Producers are making heavy use of the 1977 loan program and will have an option to enter the 3-year reserve program. The reserve can definitely be a pricing factor.
- The pace of the 1977 fall harvest. The spread between country and nearby future corn prices has been unusually tight and it appears that rain-slowed harvest has helped to avoid a basis glut.
- World crop developments. Production prospects for 1977-78 have generally slipped as the season progressed. It is too early to peg the Southern Hemisphere coarse grain crops harvested next spring so they may be a pricing factor later. Of course, prospects for the next season's harvest can influence prices later.

WHEAT

1977-78 A supply record

The hardness of wheat was again evidenced in 1977; in spite of droughts and floods, this year's crop of 2,027 million bushels is only 6 percent below last year's record. Planted acreage totaled 74.4 million acres, 7 percent less than 1976; harvested acreage was down 6 percent; and yields were about the same.

For the winter crop, planting took place under dry conditions and the winter was bitterly cold with little snow. Although drought prevailed in the Pacific Northwest, widespread spring rains in the plains changed the outlook quickly, and production was only 2 percent below last year.

In spring wheat areas, declining prices caused Durum growers in the northern plains to reduce acreage by one-third, and the Western States shifted out of Durum in favor of other crops. The net result was that the 1977 Durum crop was down about 40 percent from last year's record. Growers of other spring wheat reduced plantings by 12 percent. The smaller acreage more than offset slightly higher yields and the 1977 spring crop of 416 million bushels was 7 percent below a year ago.

With the largest June 1 carryover since 1963, total wheat supplies for the 1977-78 crop year were over 3 billion bushels, an all-time record.

Heavy wheat feed use

Wheat feeding during June-September was around 150 million bushels, the largest for that period since 1972 as low prices during early harvest attracted feeders to wheat. But the early season price advantage of feeding wheat faded quickly during late summer as feed grain prices fell sharply and wheat prices began to rise. Thus, wheat feeding will be slow this fall, although wet harvest conditions in the northern plains resulted in some low quality wheat which will likely move into feeding channels. Still, wheat feeding for the season is expected to total over 200 million bushels, the largest since 1971-72.

Wheat exports slow but prospects improve

Weather developments have reduced 1977 world wheat crop prospects, particularly in the Soviet Union and the Southern Hemisphere; lowered crop quality in major producing areas; and increased import demand to a record level. Other exporting nations have already booked much of their expected 1977-78 foreign sales which means that

the United States likely will supply any large additional world import demand. Export commitments as of October 30 totaled 672 million bushels, 7 percent below that time in 1976.

Though exports are running slower than last season, for the season they are expected to be well above the 950 million bushels shipped in 1976-77.

Loan activity heavy

Low wheat prices expanded growers' participation in Government loan and reserve programs which on October 1 accounted for over 800 million bushels or one-third of wheat stocks. About 400 million bushels of 1977 wheat, nearly 20 percent of the crop, was under loan. About 375 million bushels of the 1976 crop remain under loan and substantial portions of eligible 1976 wheat have been placed in the 3-year reserve program.

Wheat prices recover from 5-year low

Abundant carryover stocks and the bountiful 1977 harvest pushed wheat prices last summer to their lowest level since February 1973. As the harvest glut passed, growers' marketing and inventory strategies become apparent with their heavy use of the loan program. At the same time, prospects for the world wheat crop slipped and world trade increased while commercial demand in U.S. markets began to increase. All of these factors have contributed to a price rise of 40 to 50 cents a bushel by early November. It appears that farm prices will likely continue to strengthen during much of the remainder of the season.

RICE

The 1977-78 U.S. rice marketing year kicked off with a smaller supply, larger export sales, stronger prices, and the prospect of some reduction in carryover stocks.

Stocks at the start of the 1977-78 season were up 8 percent from the year ago record; however, nearly half were inventories of the Commodity Credit Corporation (CCC). Reduced plantings and less favorable growing and harvesting conditions cut the prospective 1977 U.S. rice crop to 99 million hundredweight—around 15 percent less than 1976's level. Thus, this year's supply of 138 million hundredweight is about a 10th below last year's record.

Domestic use in 1977-78 is likely to rise modestly in line with the upward trends for food and brewer's use. Because of smaller crops in some major producing countries and continued expansion in world rice consumption, exports are expected to run 5 percent above last season's high level. Export commitments for 1977-78 are well ahead of the pace of recent years.

Total U.S. disappearance will likely be larger than this year's harvest, so stocks at year's end would decline for the first time since 1974-75. These developments, and the very strong early season foreign demand, have lifted prices well above year ago levels. Prices will likely average 20 to 25 percent above the \$6.63 per hundredweight estimated for 1976-77.

New rice legislation that will apply to the 1978-81 crops is part of the Food and Agriculture Act of 1977. Many of the program provisions are similar in nature to those found in the 1975 Rice Act.

FEED SITUATION

Increased supplies and lower prices of feed concentrates in 1977-78 should encourage continued expansion of livestock and poultry feeding. Roughage feed supplies were relatively short in some areas last summer but late summer and fall rains improved the situation in many areas. With much larger soybean and cotton crops, indications point to potentially abundant oilseed meal supplies.

Current estimates for the 1977-78 feed year which began October 1, indicate concentrate use at about 156 million metric tons, up 5 percent from the 1976-77 level. Compared with last year, feed grains and protein feeds are likely to account for a larger part of this total.

CORN

Another record crop

U.S. corn production based on November 1 conditions is forecast at a record 6,367 million bushels, up 2 percent from last year's crop. The Nation's corn yield, forecast at 91.5 bushels per acre, is about 4 bushels more than in 1976. Yields for the Midwest ranged from 88 bushels per acre in Iowa to 109 bushels in Illinois. Compared with 1976, production in the western Corn Belt is estimated to be up about a fifth and in the eastern portion about unchanged.

Low prices spurs feeding

Corn use by U.S. feeders in 1977-78 is expected to increase about 7 percent, to near 3.8 billion bushels, because of low feed grain prices relative to livestock and poultry prices and tight roughage supplies in some areas that required early supplemental feeding.

Export prospects improve

U.S. corn exports in 1977-78 are now expected to match the 1.7 billion bushels during the past two seasons. Persistent rains during harvest over much of Europe and western U.S.S.R. caused above normal harvesting losses, as well as lowered quality, and dry weather has lowered crop prospects in the Southern Hemisphere. As a result, world imports of coarse grains are expected to be record large.

Bookings of U.S. corn by importers have lagged well behind the pace of recent years. As of October 30, commitments for 1977-78 totaled only 554 million bushels compared to 775 million a year earlier.

Stocks continue to build; price outlook brighter

Projected corn disappearance falls short of the indicated crop so carryover stocks next October are likely to increase again. Average prices received by farmers in 1977-78 likely will range close to the national loan rate. Prices at the farm in September and early October ran around \$1.60 a bushel, about a dollar less than a year earlier. The price weakness could be attributed to the prospective record supply that caused some backups in the distribution system, the earlier than normal harvest, and large old stocks. But, wet weather slowed harvest and recent developments in the U.S.S.R. grain crop have contributed to price firmness in late October. Thus, the marketing spread this fall has been fairly narrow, despite earlier reports of an impending storage crunch.

Once the crop is under shelter, farmers' activity in the loan program accelerates, and demand increases, prices during the course of the marketing year likely will rise more than seasonally. A sizable volume of corn going into USDA's grain reserve program also will bolster prices later in the marketing year.

Farmers active in the loan program

With supplies having more than caught up with demand and prices close to loan rates, farmers are changing their marketing strategies. Those with storage likely will place much of their 1977 crop in the Government loan program. As much as 10 to 20 percent of the 1977 crop could be placed under loan during 1977-78. By the end of October, about 190 million bushels or 3 percent of the crop was under loan.

SORGHUM

The November 1 forecast for sorghum production was 779 million bushels, 8 percent above 1977. While acreage is down, the average yield, estimated at 55.4 bushels, is 7 bushels more than in 1976. The Texas crop is forecast to be down about a fifth from 1976, as sorghum acreage was shifted to cotton, soybeans, and corn. However, crops in Kansas, Nebraska, and Missouri are up sharply.

With an October 1 carryover of 91 million bushels, the sorghum supply for 1977-78 would total about 870 million bushels, up about 10 percent from last season.

Sorghum feeding may increase 10 to 12 percent in 1977-78. Wheat feeding is not as attractive as last summer when wheat prices were low compared with sorghum. The comparatively low sorghum prices, coupled with 5 percent more cattle on feed this fall, is likely to result in liberal feeding or sorghum during October-May.

Sorghum exports for 1977-78 are projected between 200 and 250 million bushels compared to 250 million bushels shipped in 1976-77. Poorer quality world wheat suggests that more wheat will be fed in lieu of feed grains during 1977-78. However, relatively low domestic sorghum prices, and prospects for reduced availabilities from Argentina in 1978, will enhance the competitiveness of U.S. sorghum.

With production indicated above expected usage for the third consecutive season, carryover stock of sorghum next October will likely increase substantially. Sorghum prices received by farmers in 1977-78 are projected to range around the national average loan rate of \$3.39 per hundredweight. Prices declined about \$1 per hundredweight since last spring but have strengthened in recent weeks and likely will rise more than seasonally. By the end of October around a tenth of the crop had been placed under loan.

OATS

Oats fed to livestock in June-September totaled 222 million bushels, 7 percent above a year earlier and the first increase for the period in 4 years. Contributing to heavier oat feeding is the sharp drop in oat prices since last spring when they were record high. With the much larger 1977 crop coupled with slumping prices for other grains, oats at the farm last summer were bringing only about 90 to 95 cents a bushel.

Total use of oats in 1977-78 likely will fall short of production, resulting in between 250 and 325 million bushels carried over into 1978-79, the largest since 1974.

During recent years, oats prices were 5 to 10 percent above corn—pound-for-pound basis—compared with a traditional relationship of 10 to 15 percent below the price of corn. During June-October, oat prices averaged about the same as corn—pound basis—and likely will continue to do so for the remainder of the season.

BARLEY

Barley disappearance during June-September was down 16 percent from a year earlier when there was considerable wheat fed in lieu of barley. But stronger wheat prices could lead to some step-up in barley feeding during October-May. In this event, barley feeding for the entire season may be down only about a tenth.

Exports during June-September were the largest since 1973. Barley exports projected for 1977-78 total 60 million bushels, down from the 66 million shipped in 1976-77.

Prices of feed barley prices also have fallen sharply. Feed barley, at Minneapolis during June-September averaged around \$1.60 per bushel, down around 90 cents from a year earlier. During the summer, barley averaged about the same as corn on a pound-for-pound basis, but a year earlier, barley was about 5 percent more than corn. Traditionally, barley averages around 90 to 95 percent of corn.

Barley prices during 1977-78 likely will move up a bit more than seasonally, because of good export demand and farmers' use of the loan program.

OUTLOOK FOR 1978

1978 Programs may be major influence

The recently enacted Food and Agriculture Act of 1977 has provisions for set-aside and deficiency payments which are similar to previous programs.³ But there are major changes in how these programs will operate that will affect cropping decisions. USDA has indicated a 20-percent wheat set-aside and has evaluated a number of alternatives for feed grains. A decision on 1978 set-aside programs will be announced by November 15. Here are major proposals of program provisions:

- Under the indicated wheat set-aside, if wheat is planted, all set-aside requirements must be met to be eligible for USDA loans, purchase agreements, and payments on eligible commodities. In other words, if there is a set-aside for feed grains and wheat and both are produced, a grower can't be in one program and not the other and receive program benefits. Also, if growers don't participate in the wheat set-aside but plant wheat, they lose program benefits for crops which have no set-aside requirements.
- The 1978 wheat loan rate will remain at \$2.25 per bushel unless the average U.S. farm price for 1977-78 exceeds \$2.36 per bushel.

³ For a detailed discussion of the provisions see, "Commodity Program Provisions Under the Food and Agriculture Act of 1977," James Johnson and Milton R. Erickson, Agr. Econ. Rpt. No. 389, Econ. Res. Serv., USDA, Oct. 1977.

In this event, the rate would rise to \$2.35. Loan rates for feed grains have not been announced.

- The wheat target price rises to \$3 if the 1978 crop equals or exceeds 1.8 billion bushels, or \$3.05 if it is below 1.8 billion bushels. The target price for corn will be \$2.10 per bushel; sorghum, barley, and oats (if designated) have not been announced.
- Under the indicated wheat set-aside program, acreage to be set aside must equal 20 percent of the actual planted acreage to be harvested for grain. Fallow land will likely not be counted as set-aside nor counted as planted acreage.
- Set-aside acreage must have an approved cover crop such as forages or small grains that are not allowed to mature.
- The national program acreage is the number of harvested acres required to meet estimated domestic and export needs plus any desired change in carry out stocks.
- Target price payments will be made on a percentage of 1978 plantings for harvest and the farm program yield. The percentage or allocation factor will be determined by dividing the national program acreage by the number of acres harvested for grain.
- If 1978 wheat acreage planted for grain harvest is reduced 20 percent from 1977 and meets all set-aside requirements, the entire acreage will be eligible for target price payments.
- The total of "normal crop acreage" (NCA) must be reduced by the amount of the set-aside. Basically, NCA is the land that was cropped in 1977, adjusted for abnormal situations. Crops proposed for NCA include wheat, barley, oats, rye, corn, sorghum, rice, soybeans, flax, sunflowers, sugarbeets, sugarcane, upland cotton, and dry edible beans.
- Limitation on all payments a person may receive for all crops in 1978 is \$40,000. Payments for disaster, certain resource adjustments, and public access for recreation do not count against the limit.

Factors affecting plantings

Unless there is a major crop failure somewhere in the world next year it looks as if prices in 1978-79 will continue to average around loan levels. With this price outlook, target price payments may become an important income factor in deciding whether to participate in programs. Also, eligibility for the loan, reserve, and disaster programs will bear on 1978 set-aside decisions.⁴

The indicated 1978 wheat program offers strong economic incentives, so it appears that participation would be heavy and plantings may be down substantially from the 74.4 million acres in 1977. Still, with moisture conditions through the entire Wheat Belt much improved from a year ago, yield prospects appear brighter, so the reduction in production will likely be less than the cut in acreage.

⁴ For some specifications of program impacts see "Analyzing the Impact of Government Programs on Crop Acreage," Hauck, Abel, Ryan, Gallagher, and Pennsylvania Technical Bulletin No. 1548, Economic Research Service, USDA, in cooperation with the University of Minnesota Agricultural Experiment Station, August 1976.

WHEAT AND RICE (DOMESTIC MEASURE)¹

| Commodity | Unit | 1975/76 | 1976/77 prelim. | 1977/78 | |
|--------------------------------|--------------------------------|---------|--------------------|-----------|-----------------------------------|
| | | | | Proj. | Probable variability ² |
| WHEAT | | | | | |
| Area: | | | | | |
| Planted..... | Million acre..... | 75.1 | 80.2 | 74.4 | |
| Harvested..... | do..... | 69.6 | 70.8 | 66.6 | |
| Yield per harvested unit..... | Bushel per acre..... | 30.7 | 30.3 | 30.4 | |
| Beginning stocks..... | Million bushel..... | 435 | 664 | 1,111 | |
| Production..... | do..... | 2,135 | 2,147 | 2,027 | +30 to -30. |
| Imports..... | do..... | 2 | 3 | 2 | |
| Supply, total..... | do..... | 2,572 | 2,814 | 3,140 | |
| Domestic: | | | | | |
| Food..... | do..... | 559 | 553 | 558 | +10 to -10. |
| Seed..... | do..... | 95 | 88 | 80 | +5 to -5. |
| Feed..... | do..... | 81 | 112 | 220 | +30 to -30. |
| Domestic, total..... | do..... | 735 | 753 | 858 | +45 to -45. |
| Exports..... | do..... | 1,173 | 950 | 1,100 | +100 to -100. |
| Disappearance, total..... | do..... | 1,908 | 1,703 | 1,958 | +135 to -135. |
| Ending stocks..... | do..... | 664 | 1,111 | 1,182 | +165 to -165. |
| Season average farm price..... | Dollar per bushel..... | 3.55 | 2.85 | 2.15-2.35 | |
| RICE | | | | | |
| Area: | | | | | |
| Allotment..... | Million acre..... | 1.80 | 1.80 | 1.80 | |
| Planted..... | do..... | 2.82 | 2.51 | 2.21 | |
| Harvested..... | do..... | 2.80 | 2.50 | 2.20 | |
| Yield per harvested unit..... | Pound per acre..... | 4,567 | 4,679 | 4,500 | |
| Beginning stocks..... | Million hundred-weight..... | 7.1 | 36.9 | 39.7 | |
| Production..... | do..... | 128.0 | 117.0 | 99.1 | +2 to -2. |
| Imports..... | do..... | | | | |
| Supply, total..... | do..... | 135.1 | 153.9 | 138.8 | |
| Domestic..... | do..... | 40.2 | 42.8 | 45.3 | +2 to -2. |
| Exports..... | do..... | 56.5 | 65.6 | 68.0 | +5 to -5. |
| Disappearance, total..... | do..... | 96.7 | 108.4 | 113.4 | +5 to -5. |
| Ending stocks..... | do..... | 36.9 | 39.7 | 25.5 | +7 to -7. |
| Difference unaccounted..... | do..... | +1.5 | +5.8 | | |
| Season average farm price..... | Dollar per hundred-weight..... | 8.34 | 6.63 | 8.00-9.00 | |

See footnotes at end of table.

FEED GRAINS AND CORN (DOMESTIC MEASURE)¹

| Commodity | Unit | 1975/76 | 1976/77 prelim. | 1977/78 | |
|--------------------------------------|------------------------|---------|--------------------|-----------|-----------------------------------|
| | | | | Proj. | Probable variability ² |
| FEED GRAINS | | | | | |
| Area: | | | | | |
| Planted..... | Million acres..... | 123.4 | 129.5 | 128.7 | |
| Harvested..... | do..... | 105.1 | 106.8 | 107.7 | |
| Yield per harvested unit..... | Ton per acre..... | 1.93 | 1.99 | 2.06 | |
| Beginning stocks..... | Million short ton..... | 16.8 | 19.0 | 32.9 | |
| Production..... | do..... | 203.3 | 212.4 | 221.9 | +4 to -4. |
| Imports..... | do..... | .5 | .3 | .3 | |
| Supply, total..... | do..... | 220.6 | 231.7 | 255.1 | |
| Feed..... | do..... | 127.7 | 123.2 | 131.2 | +8 to -8. |
| Food, seed, and industrial uses..... | do..... | 18.8 | 19.8 | 20.4 | |
| Domestic, total..... | do..... | 146.5 | 143.0 | 151.6 | +8 to -8. |
| Exports..... | do..... | 55.1 | 55.8 | 55.5 | +3 to -3. |
| Use, total..... | do..... | 201.6 | 198.8 | 207.1 | +9 to -9. |
| Ending stocks..... | do..... | 19.0 | 32.9 | 48.0 | +6 to -6. |
| CORN | | | | | |
| Area: | | | | | |
| Planted..... | Million acre..... | 78.2 | 84.1 | 82.4 | |
| Harvested..... | do..... | 67.2 | 71.1 | 69.6 | |
| Yield per harvested unit..... | Bushel per acre..... | 86.2 | 87.4 | 91.5 | |
| Beginning stocks..... | Million bushel..... | 359 | 398 | 879 | |
| Production..... | do..... | 5,797 | 6,216 | 6,367 | +140 to -140. |
| Imports..... | do..... | 2 | 2 | 1 | |
| Supply, total..... | do..... | 6,158 | 6,616 | 7,247 | |
| Feed..... | do..... | 3,558 | 3,538 | 3,775 | +200 to -200. |
| Food, seed, and industrial uses..... | do..... | 491 | 515 | 530 | +10 to -10. |
| Domestic, total..... | do..... | 4,049 | 4,053 | 4,305 | +200 to -200. |
| Exports..... | do..... | 1,711 | 1,684 | 1,700 | +100 to -100. |
| Use, total..... | do..... | 5,760 | 5,737 | 6,005 | +250 to -250. |
| Ending stocks..... | do..... | 398 | 879 | 1,242 | +200 to +200. |
| Season average farm price..... | Dollar per bushel..... | 2.54 | 2.20 | 2.00-2.20 | |

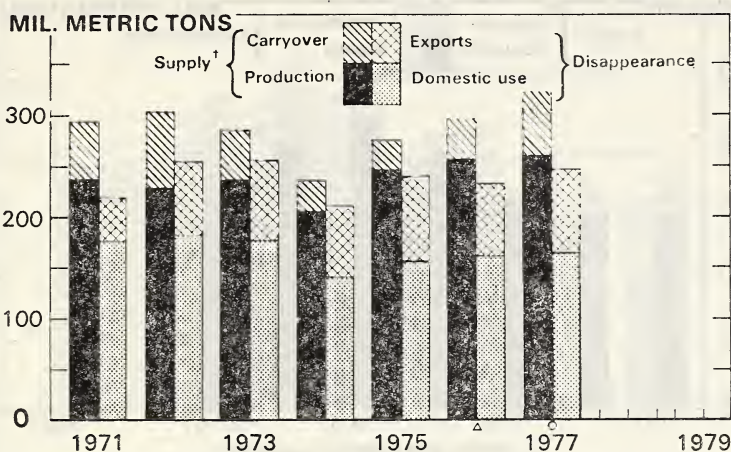
See footnotes at end of table.

SORGHUM, BARLEY, AND OATS (DOMESTIC MEASURE)⁴

| Commodity | Unit | 1975/76 | 1976/77 prelim. | 1977/78 | |
|----------------------------|-------------------|---------|--------------------|-----------|-----------------------------------|
| | | | | Proj. | Probable variability ² |
| SORGHUM | | | | | |
| Yield per harvested unit | Bushel per acre | 49.0 | 48.6 | 55.4 | |
| Beginning stocks | Million bushel | 35 | 52 | 91 | |
| Production | do | 760 | 742 | 779 | +35 to -35. |
| Imports | do | | | | |
| Supply, total | do | 795 | 776 | 870 | |
| Feed | do | 508 | 433 | 475 | +50 to -50. |
| Food, seed, and industrial | do | 6 | 6 | 6 | |
| Domestic, total | do | 514 | 439 | 481 | +50 to -50. |
| Exports | do | 229 | 246 | 225 | +25 to -25. |
| Use, total | do | 743 | 685 | 706 | +60 to -60. |
| Ending stocks | do | 52 | 91 | 164 | +50 to -50. |
| Season average farm price | Dollar per bushel | 2.37 | 1.95 | 1.85-2.05 | |
| BARLEY | | | | | |
| Yield per harvested unit | Bushel per acre | 43.9 | 44.8 | 42.2 | |
| Beginning stocks | Million bushel | 92 | 129 | 126 | |
| Production | do | 384 | 377 | 405 | +10 to -10. |
| Imports | do | 16 | 11 | 10 | |
| Supply, total | do | 492 | 517 | 541 | |
| Feed | do | 192 | 168 | 150 | +25 to -25. |
| Food, seed, and industrial | do | 147 | 157 | 164 | +5 to -5. |
| Domestic, total | do | 339 | 325 | 314 | +25 to -25. |
| Exports | do | 24 | 66 | 60 | +5 to -5. |
| Use, total | do | 363 | 391 | 374 | +20 to -20. |
| Ending stocks | do | 129 | 127 | 167 | +20 to -20. |
| Season average farm price | Dollar per bushel | 2.43 | 2.29 | 1.65-1.85 | |
| OATS | | | | | |
| Yield per harvested unit | Bushel per acre | 48.3 | 45.4 | 52.7 | |
| Beginning stocks | Million bushel | 224 | 208 | 168 | |
| Production | do | 658 | 562 | 759 | +25 to -25. |
| Imports | do | 1 | 1 | 1 | |
| Supply, total | do | 883 | 771 | 923 | |
| Feed | do | 574 | 504 | 540 | +50 to -50. |
| Food, seed, and industrial | do | 87 | 89 | 90 | +5 to -5. |
| Domestic, total | do | 661 | 593 | 630 | +50 to -50. |
| Exports | do | 14 | 10 | 10 | +2 to -2. |
| Use, total | do | 675 | 603 | 640 | +40 to -40. |
| Ending stocks | do | 208 | 168 | 288 | +35 to -35. |
| Season average farm price | Dollar per bushel | 1.46 | 1.55 | 1.05-1.15 | |

¹ Marketing year beginning June 1 for wheat, Aug. 1 for rice.² The probable variability reflects the SRS estimate of "root mean square error" for production. The chances are about 2 out of 3 that the final outcome would fall within the indicated range. Comparable estimates of variability are used for other items in the S/U balance.³ Marketing year beginning Oct. 1 for corn and sorghum; June 1 for barley and oats.⁴ Marketing year begins Oct. 1 for sorghum, June 1 for barley and oats.

TOTAL GRAIN SUPPLY AND DISAPPEARANCE*

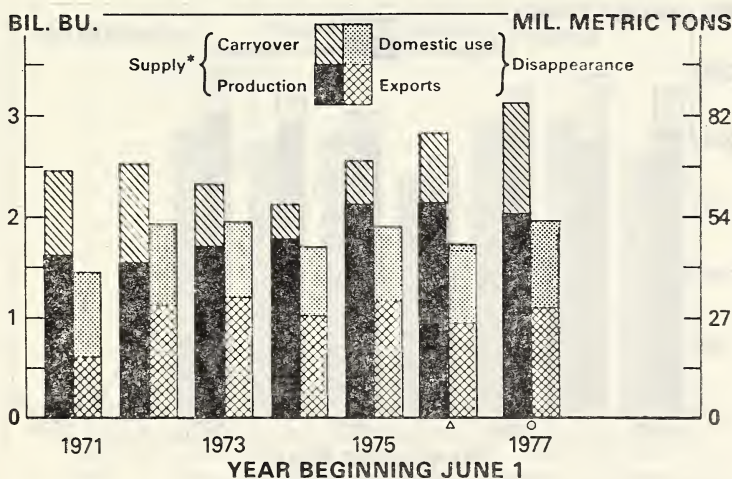


* YEAR BEGINNING OCT. 1 FOR CORN AND SORGHUM, JUNE 1 FOR OATS, BARLEY, WHEAT, AND RYE; AND AUG. 1 FOR RICE.
 † INCLUDES IMPORTS. Δ PRELIMINARY. ○ PROJECTED.

USDA

NEG. ERS 2558-77 (11)

WHEAT SUPPLY AND DISAPPEARANCE

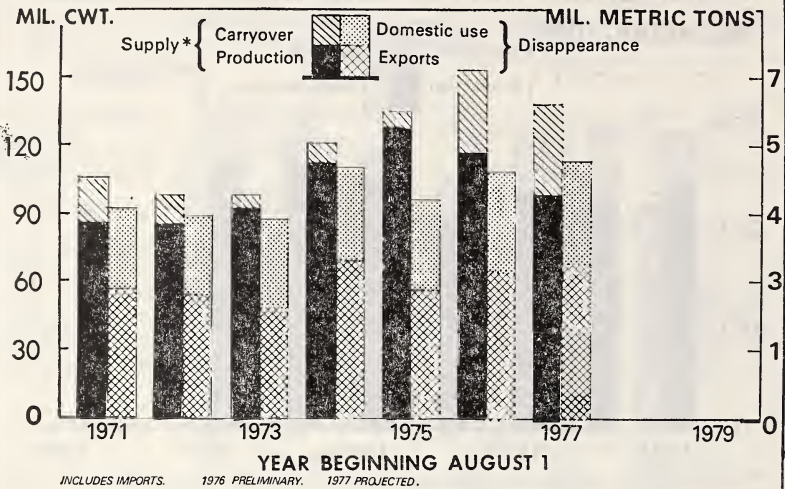


* INCLUDES IMPORTS. Δ PRELIMINARY. ○ PROJECTED.

USDA

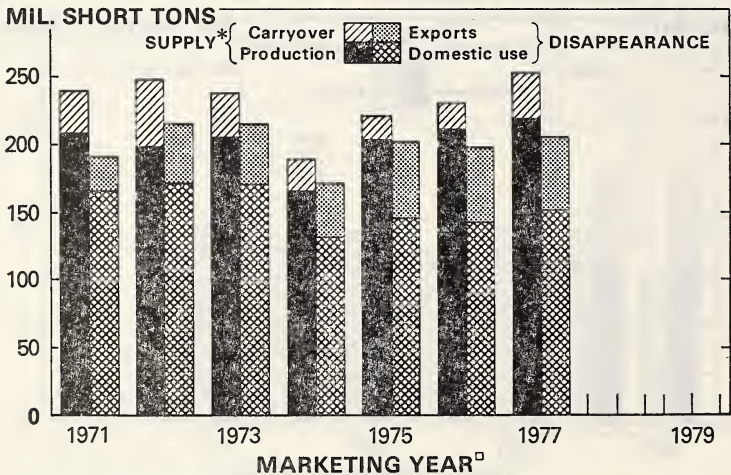
NEG. ERS 2117-77 (11)

ROUGH RICE SUPPLY AND DISAPPEARANCE



NEG ERS 2119-77

FEED GRAIN SUPPLY AND DISAPPEARANCE

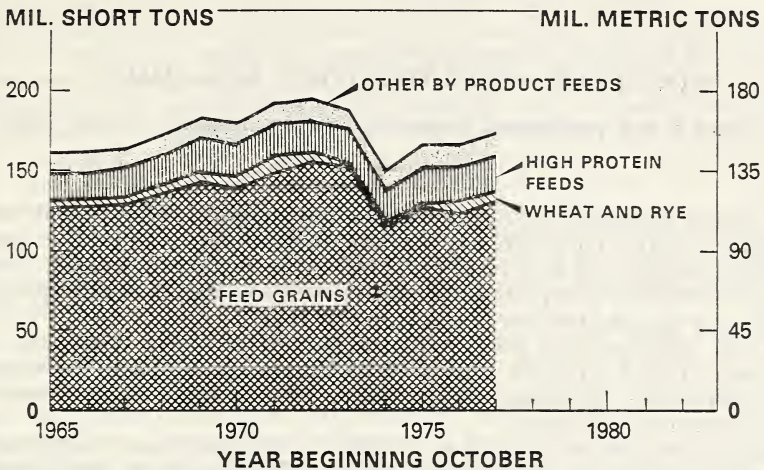


* BEGINNING OCTOBER 1 FOR CORN AND GRAIN SORGHUM; JUNE 1 FOR OATS AND BARLEY.
 □ INCLUDES MINOR VOLUME OF IMPORTS. 1976 PRELIMINARY. 1977 PROJECTED.

USDA

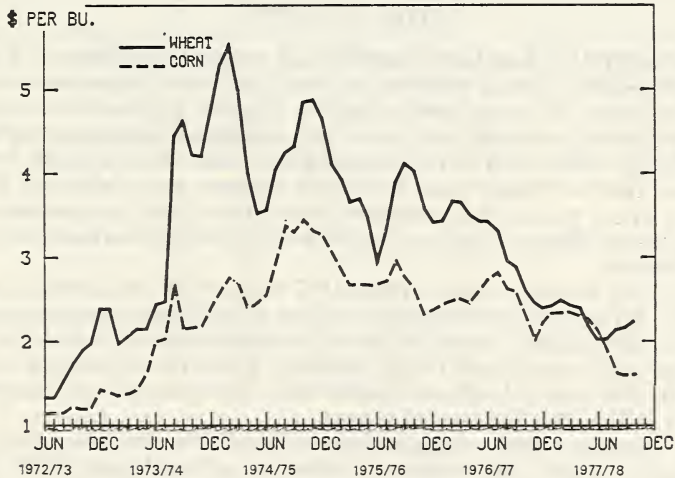
NEG. ERS 471-77 (11)

FEED CONCENTRATES FED



1976 PRELIMINARY. 1977 PROJECTED.

PRICES RECEIVED BY FARMERS



USDA

NEG.ERS 2589-77(11)

OUTLOOK FOR LIVESTOCK AND MEAT

(By James E. Nix, Agricultural Economist, Economic Research Service, USDA)

Current prospects point to continued large supplies of red meat and poultry in 1978. However, the mix will be different from 1977 as beef production declines and pork and poultry production increases. This supply situation is expected to result in somewhat higher cattle prices and lower hog and poultry prices than this year.

Total red meat and poultry production in 1977 will about match the record high of 1976. Pork and broiler production will be above the year-earlier level but the production of beef and other red meats and turkeys will be down.

Large supplies of meat have resulted in fed cattle and hog prices remaining relatively stable throughout much of this year. Consumers have been able to choose from large supplies of meat. Retail beef prices this year have remained relatively stable and near the level of the second half of 1976. During the first three quarters of 1977, retail pork prices have averaged substantially below their year-earlier level but slightly above late 1976 prices.

CATTLE SITUATION

Financially this has been another bad year for cattlemen. Feeder cattle prices have risen a little but so have production expenses for cow-calf producers. It is unlikely that the slightly higher feeder cattle prices put many cow-calf producers in a profitable operating position, particularly when both variable and fixed costs are included. It also has been another rough year for cattle feeders, especially the first 6 months. Their production expenses, other than feed costs which was lower after midyear, also rose while fed cattle prices remained near the 1976 level.

Significant developments during 1977 that affect the cattle industry were the failure of cattle prices to show significant increases, rising costs for most inputs, large feed grain and soybean crops, and low forage supplies in some parts of the country. These developments had an effect on this year's beef production and their impact on the cattle industry will be felt for several years.

More abundant grain supplies lowered cattle feeders' feed costs per 100 pounds of gain this summer to the lowest level since 1973. Feed costs per 100 pounds of grain during the first half of 1977 were about the same as a year earlier. However, second half feeding costs have declined substantially, perhaps by \$10 or more per hundredweight.

Even before feed costs dropped this summer, cattle feeders were increasing the number of cattle placed on feed. Then, during the third quarter when feed costs dropped substantially, placements of cattle

on feed increased by 14 percent. This raised the October 1, 1977, inventory of cattle on feed 5 percent above a year earlier—pointing to larger quantities of fed cattle over the next several months.

In general, forage supplies during 1977 have been less plentiful than grain supplies. Severely cold weather during the winter of 1977 froze out some of the pasture crops in the Eastern half of the United States that normally supply some winter grazing. Also, increased hay feeding was required and many beef cattle, particularly cows, were sent to slaughter. Drought conditions over many parts of the Nation this summer caused very poor grazing conditions and the hay crop in these areas was below normal. This also forced liquidation of more of the cattle herd. Grazing conditions generally improved during late summer and early fall, especially in the East. However, forage supplies going into this winter remain uncertain in the Southeast and parts of the West.

Fed cattle slaughter during 1977 will probably be about 2 percent above the year-earlier level and account for about 62 percent of total commercial cattle slaughter. Cattle feeders placed heavier animals on feed during late 1976 and through much of this year. This contributed to a faster rate of turnover of cattle in feedlots. Fed cattle marketings remained above year-earlier levels during the first half of this year and was down slightly in the summer. This occurred even though the inventory of cattle on feed was below last year's level.

Although still relatively high, nonfed steer and heifer slaughter this year probably will be 10 to 12 percent below the 1976 level. A large inventory of yearling cattle has helped sustain this high level of nonfed slaughter and at the same time support a sizable placement of yearlings on feed. Poor grazing conditions in many areas and low yearling feeder cattle prices also contributed to this continuing high level of nonfed slaughter. Calf slaughter has also remained high. With a smaller 1977 calf crop and with calf and nonfed steer and heifer slaughter remaining relatively high, the supply of feeder cattle is declining. Liquidation of the cow herd has continued throughout this year with a commercial cow slaughter of about 9.7 million head. Low calf prices and poor grazing conditions in many areas contributed to this continuing high level of cow slaughter.

Total commercial cattle slaughter for 1977 will probably be about 41.5 million head, down less than 3 percent from 1976. Adding to this a commercial calf slaughter of about 5.5 million head and a farm slaughter of about 0.7 million head gives a total cattle and calf slaughter of about 47.7 million head. This would mean that almost 39 percent of the January 1, 1977, total cattle and calf inventory was slaughtered this year, the highest this percentage has been since 1957. Slaughter also exceeded this year's estimated 46.1 million head calf crop by about 1½ million head. This would be the second year in a row when total slaughter has exceeded the calf crop. Prior to 1976, total slaughter had not exceeded the calf crop since 1947.

The January 1, 1978, inventory of all cattle and calves is expected to be 117–118 million head. This would be a decline of 4 to 5 percent, about the same as in 1976. This will be the third year in this liquidation phase of the cattle cycle and the sharpest downturn in several decades. The cow inventory is also expected to be down on January 1, 1978 and total a little over 50 million head.

In addition to the shortage of forages in some areas, continuing low producer returns during 1977 contributed to a high level of slaughter and further liquidation of the cattle herd. Fed cattle prices have remained relatively stable with quarterly averages for Choice 900 to 1,100 pound steers at Omaha remaining in the range of \$38 to \$41 per hundredweight through the first three quarters of this year. Lower grain prices, which stimulated cattle feeding, have helped support a little rise in feeder cattle prices. Most of this rise, however, has been confined to the lighter weight feeders.

1978 CATTLE OUTLOOK

Feed supplies, and particularly forage supplies, will continue to be an important variable in the 1978 cattle outlook. This year's large grain crops will supply ample quantities of feed grains to support expanded cattle feeding. However, forage supplies which could have a significant impact on further herd liquidation are less certain, particularly through the winter months.

Feed costs during 1978 are expected to be below the average for the past few years, but will probably be above 1977 late summer and early fall prices. Larger supplies of grain and soybeans likely will mean more favorable feeding costs than in recent years and cattle feeding is expected to continue to expand. Placements of cattle on feed likely will show year-to-year increases this fall and through the first half of next year. The inventory of cattle on feed will continue to build even though fed cattle marketings are also expected to rise.

The buildup in the inventory of cattle on feed during late 1977, and the continuing increases in placements on feed, point to larger supplies of fed cattle in 1978. Fed marketings for the year could be up 3 to 5 percent with the largest increases coming during the last half of the year. During 1978, fed cattle slaughter likely will account for over 65 percent of the total commercial cattle slaughter.

Developments in the cattle and grain markets, however, will have an impact on cattle feeding next year. If corn prices were to rise sharply because of unexpected developments in the world market or prospects for a very poor 1978 corn crop, placements of cattle on feed and fed cattle marketings next year would likely fall below the level suggested here.

A substantial reduction is expected in the slaughter of steers and heifers directly off grass next year. Forage supplies and developments in the cattle market, however, will have a big impact on this segment of the slaughter. With good grazing conditions and some increase in cattle prices, nonfed steer and heifer slaughter next year could be reduced by one-third or more. A declining supply of feeder cattle and an increased demand for feedlot replacements by cattle feeders are expected to support a large reduction in nonfed steer and heifer slaughter. Through the winter, year-to-year reductions may not be very large but they could become substantial next spring and continue so for the remainder of the year. With poor grazing conditions, particularly during the spring and summer, next year's nonfed steer and heifer slaughter could remain relatively high.

Year-to-year reductions in cow slaughter could exceed 15 percent with good grazing conditions and rising feeder cattle prices. This would compare with a 8-9 percent reduction for 1977 and would probably be sufficient to halt the downturn in cow numbers.

Total commercial cattle slaughter for 1978 is expected to be 5 to 8 percent below this year. With fed cattle accounting for a higher percentage of the slaughter mix next year, average weights should be heavier. Thus, next year's total beef production may be off only 2 to 5 percent.

The continuing large supplies of beef, plus large supplies of competing meats, dampens the prospects for a substantial rise in fed cattle prices for 1978. Early in the year they expected to run in the high \$30's to low \$40's. They could strengthen a little in the spring and continue to trend upward during the remainder of the year. The spring price rise, however, is not expected to be substantial. The annual average price of Choice slaughter steers at Omaha could be \$1 to \$4 higher than this year's average of about \$40.

Reduced feeder cattle supplies and improved demand by cattle feeders are expected to result in higher feeder cattle prices. Prices for Choice yearling feeder steers could move to the mid- to high-\$40's for an annual average. Lighter weight feeders will probably sell at a premium over yearlings.

The projected level of slaughter would result in another reduction in the cattle inventory during 1978. With the January 1, 1978, cow inventory being down again, next year's calf crop will likely be lower than the 1977 crop. But in contrast to 1976 and 1977, total cattle and calf slaughter likely would not be larger than the expected calf crop. Nevertheless, after allowing for death losses and net imports, another slight reduction is expected in the cattle inventory on January 1, 1979. The cow herd could about stabilize during 1978 at around 50 million head.

TABLE 1.—CATTLE BALANCE SHEET

| | Jan. 1 inventory | Imports | Calf crop | Slaughter | | Death loss | Exports | To balance |
|-------------------------|---------------------|---------|-----------|-----------|--------|------------|---------|------------|
| | | | | Cattle | Calves | | | |
| 1970..... | 112.4 | 1.2 | 45.9 | 35.4 | 4.2 | 4.3 | 0.1 | -0.9 |
| 1971..... | 114.6 | 1.0 | 46.7 | 35.9 | 3.8 | 4.5 | .1 | -.1 |
| 1972..... | 117.9 | 1.2 | 47.7 | 36.1 | 3.2 | 5.1 | .1 | -.8 |
| 1973..... | 121.5 | 1.0 | 49.1 | 34.0 | 2.4 | 6.5 | .3 | -.7 |
| 1974..... | 127.7 | .6 | 50.8 | 37.3 | 3.2 | 6.1 | .2 | -.5 |
| 1975..... | 131.8 | .4 | 50.4 | 41.5 | 5.4 | 7.0 | .2 | -.5 |
| 1976..... | 128.0 | 1.0 | 47.4 | 43.2 | 5.5 | 4.5 | .2 | 0 |
| 1977 ¹ | 123.0 | 1.0 | 46.1 | 42.0 | 5.7 | 5.0 | .1 | ----- |
| 1978 ¹ | 117-118 | 1.0 | 45.5 | 39.0 | 3.6 | 4.7 | .1 | ----- |
| 1979 ¹ | 115-117 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

¹ Projected.

HOG SITUATION

Financially hog producers probably fared a little better than cattlemen this year. Hog prices were relatively favorable but rising expenses, other than feed, and larger than usual death losses reduced net returns. However, feeding costs for hog producers have been de-

clining during the latter half of 1977. Third quarter feed cost fell to the lowest level since early 1973. This helped improve hog producers' profit position.

With the large 1976 corn crop and favorable hog prices through much of 1976, hog producers began taking steps to increase pork production. Farrowings during the winter quarter of 1977 were up by 12 percent. A severely cold winter and disease problems, however, caused heavy death losses among pigs and young hogs. Then, following the severe winter and disease problems with sows, spring quarter farrowings were down 1 percent from the year earlier. This caused a lull in expanding pork production.

The expansion in pork production has resumed. Farrowings for the June-August 1977 period in the 14 States were 10 percent above those for the same period last year. Also, on September 1 producers in the 14 States reported intentions to increase farrowings by 10 and 11 percent this fall and winter, respectively.

Pork production during the first half of 1977 was about 12 percent above the year-earlier level. But, second half production this year will probably be a little below that of last year with a small increase in the summer being more than offset by a decline in the fourth quarter. This is likely even though the September 1 inventory of market hogs in the middle weight groups was about equal to a year earlier as producers continue to hold back gilts for breeding.

Commercial hog slaughter for 1977 will probably be about 77.5 million head, up 5 percent from last year and about 13 percent above the low level of 1975. Total commercial pork production for 1977 likely will total a little over 13 billion pounds, up a little over 4 percent from 1976.

Barrow and gilt prices rose seasonally during the first quarter of 1977, remained relatively stable in the second quarter but then rose seasonally during the summer. Prices this fall are declining from the summer peak and likely will average a little under \$40 per hundred-weight. The 1977 annual average price for barrows and gilts at seven markets will be near \$40, about \$3 below the 1976 average.

1978 HOG OUTLOOK

Feed costs for hog producers during 1978 are expected to be below the average for the past few years. However, as corn prices rise from their late summer and early fall lows, feeding costs will increase. If hog prices decline during 1978 as expected, hog producers will likely find their profits squeezed, particularly during the second half of next year.

If hog producers carry out their farrowing intentions as reported in September, pork production during 1978 is expected to rise substantially, perhaps by 10 percent or more. Pigs farrowed during June-August 1977 was up 10 percent and this will supply most of the slaughter hogs marketed during the winter quarter of 1978. The June-August increase in the 14 States may be somewhat larger than that for all States. If this is true, using the 14-State estimate would tend to overstate slaughter for the winter. On the other hand, the September 1,

1977, inventory of market hogs weighing less than 60 pounds was only 5 percent above the previous year.

If fall farrowing intentions are carried out, spring quarter pork production could be up 10 to 12 percent. Although less certain, indications are that second half production will also show year-to-year increases, perhaps by a larger magnitude than the first half increases. The hog-corn ratio was above 20 to 1 this summer and will probably continue so through most of this fall. This situation most likely will cause producers to go through with their intentions to substantially increase farrowings during December-February. Since we are entering the breeding season for the spring pig crop with a very favorable hog-corn ratio, we might also expect that pig crop to be up substantially. These factors suggest large increases in second half 1978 pork production.

Commercial hog slaughter for 1978 could be up 12 to 14 percent. This would probably result in a commercial pork production of 14½ to 15 billion pounds. Much larger pork supplies in 1978 are expected to result in lower market hog prices. By next fall, prices could come under strong pressure from much larger supplies and they could drop below \$30 per hundredweight at some time during the fourth quarter. An annual average of \$31 to \$34 per hundredweight for barrows and gilts at seven markets is likely.

OTHER RED MEATS AND POULTRY

Calf slaughter during 1977 has been slightly above last year. Lighter dressed weights, however, are likely to result in a slight decrease in veal production. This high level of slaughter and production occurred despite this year's smaller calf crop. Shortages of feed in various areas probably accelerated the movement of calves to slaughter during 1977 as producers adjusted their cattle and calf numbers to be more in line with their forage supplies. An improved demand for feeder calves by cattle feeders and a further reduction in the supply of calves is expected to result in a substantial reduction in calf slaughter and veal production during 1978.

Lamb and mutton production continues its long term downward trend. During 1977, production declined by about 3 percent from the year-earlier level. This downward trend is expected to continue through 1978 since the inventory of sheep and lambs was further reduced this year.

Broiler production during 1977 continued its expansion of recent years, reflecting favorable broiler-feed price relationships. It will probably show an annual increase of about 3 percent this year. Turkey production, on the other hand, is expected to show a slight decline. In response to low feed costs, both broiler and turkey producers are expected to expand output during 1978. This expansion is expected to result in an increase of 4 to 6 percent in combined broiler and turkey production next year. Larger supplies of poultry products in 1978 will again compete strongly with red meats for the consumer dollar.

CONSUMPTION AND RETAIL PRICES

Per capita consumption of red meats and poultry will total almost 247 pounds in 1977, nearly matching the 1976 level. Per capita beef consumption will be down almost 4 pounds while pork consumption is up a little over 2 pounds and broilers about 1 pound. Combined, per capita consumption of other red meats (veal and lamb and mutton) and other poultry will about equal the 1976 consumption of these meats.

In 1977, this high level of meat consumption has occurred with retail red meat prices falling a little below the 1976 level. Retail beef prices will average near their 1976 level but retail pork prices will be down almost 10 cents per pound.

In 1978, total per capita consumption of red meats and poultry are again expected to be about the same as they were in 1976 and 1977. Per capita beef consumption is expected to drop 3 to 7 pounds below the 1977 level as retail beef prices rise. Rising consumer incomes are expected to support some increase in retail beef prices, even though total meat consumption will about match 1977's high level. The year-to-year increase is expected to be from 5 to 9 cents per pound. A substantial decline in the slaughter of cows and nonfed steers and heifers would result in a sharp reduction in the supply of beef that normally goes into hamburger. With the apparent demand that has built up for hamburger, such a reduction in supply could result in larger price increases for hamburger than for beef cuts such as Choice steaks.

Per capita pork consumption in 1978 could be 6 to 8 pounds above this year as retail prices fall, perhaps by 3 to 7 cents per pound. Continuing large supplies of beef and increasing supplies of broilers will exert a downward pressure on pork prices.

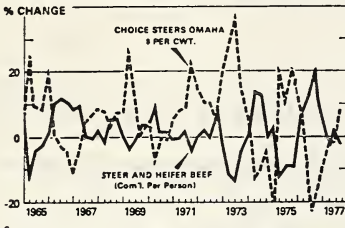
Per capita broiler consumption is expected to be up 1 to 2 pounds while the combined per capita consumption of other red meats and other poultry could be about unchanged to down slightly.

It all sums up to consumers continuing to have a large selection of meats from which to choose in 1978. Overall, rises in retail meat prices will probably be very small. Large supplies of each type of red meat will cause strong price competition among the meats. The possible exception to the abundant supply could be hamburger, which could show the largest price increase of any of the meats at the retail level.

A GLIMPSE AT 1979

The recent high levels of meat production and consumption could taper off some in 1979. Beef production will likely continue to decline as this liquidation phase of the cycle winds down and herd rebuilding gets underway. Pork production could also begin to taper off, particularly late in the year. This decline could occur if pork supplies during 1978 increase enough to push hog prices down to the low \$30's during the last half of the year. Prices this low would probably cause losses that would cause pork producers to begin cutting back, which could mean lower pork supplies by late 1979.

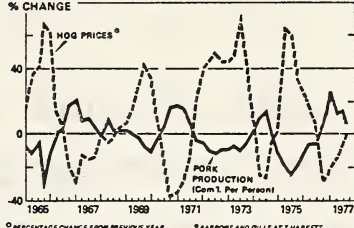
CHANGES IN BEEF PRICES AND PRODUCTION



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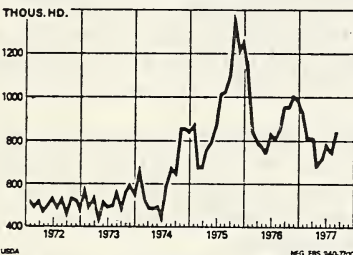
CHANGES IN HOG PRICES AND PORK PRODUCTION



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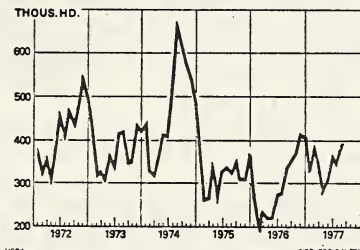
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COMMERCIAL COW SLAUGHTER



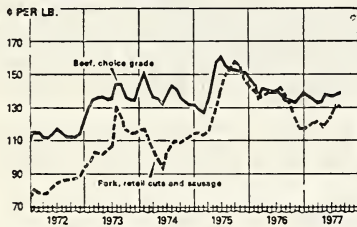
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COMMERCIAL SOW SLAUGHTER



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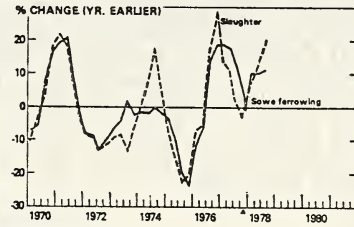
RETAIL MEAT PRICES*



USDA

NEG ERS 2210.77/101

SOWS FARROWING AND COMMERCIAL HOG SLAUGHTER*



USDA

NEG ERS 2300.77/101

CATTLE SITUATION AND OUTLOOK FOR 1978

(By Bruce A. Ginn, Project Leader, Western Livestock Marketing Information Project, ERS, USDA)

Higher prices for all classes of cattle and beef are expected in 1978. The large inventory reduction since 1975 will impact on prices at both the producer and consumer levels. Rising consumer income and population should bolster demand. However, price increases, especially for slaughter cattle and beef, could be tempered by more marketings from feedlots, larger production of pork and poultry, and continued consumer allocations to nonfood purchases. The dominant factors in the 1978 Outlook are:

(1) *Lower beef production.*—Reduced slaughter of cattle directly from pastures should more than offset larger marketings from feedlots.

(2) *Relatively depressed grain prices.*—Partially in response to lower costs of grain, placements of cattle in feedlots have been substantial and will lead to higher fed cattle supplies.

(3) *Large production of competing meats.*—Abundant pork and poultry supplies will make prices of those meats more attractive to consumers in comparison to beef.

(4) *Higher consumer income.*—Historically a positive factor, increases in consumer income may not bolster cattle prices as in the past.

(5) *Inflationary pressures.*—Marketing spreads may not expand as rapidly as in recent years, but a limit exists as to the extent the farm-to-retail price spread can narrow.

(6) *Changes in market structure.*—The affect of verticle integration and institutional demand may contribute to a different price effect than in past years.

CATTLE SLAUGHTER

Commercial cattle slaughter for 1978 is forecast at 40 million head, down 3 percent from the 41.5 million in 1977. All of the decline will be in nongrain-fed cattle slaughtered directly from pasture. This represents an important change in the composition of beef supply—more fed cattle from feedlots and fewer nonfed types. In 1978, about 66 percent of total cattle slaughter may be from feedlots compared with 52 percent in 1975.

Most of the conditions sufficient for increased placements of cattle on feed and marketings from feedlots exist. Grain prices are low relative to levels of past years. Slaughter cattle prices have been stable and shown limited strength.

Some cattle feeders have realized profits in recent months. Feeder cattle supplies are adequate to accommodate a rise in placements. Feedlot capacity is available to handle more cattle on feed.

CATTLE INVENTORIES AND PASTURE CONDITIONS, 1977

[Percent of all cattle on each pasture condition]

| Condition | January | April | July | October |
|---------------------|---------|-------|------|---------|
| Severe drought..... | 9.5 | 8.8 | 8.4 | 2.8 |
| Very poor..... | 25.9 | 16.6 | 20.4 | 14.6 |
| Poor to fair..... | 38.3 | 51.1 | 48.3 | 28.2 |

With feed grain prices low, many farmer-feeders in the Midwest are considering feeding cattle. In recent months, placements in the Northern Plains and Western Corn Belt exceeded year earlier levels by more than 20 percent. The shift toward more feeding in the Midwest increases the possibility of heavier weights and backlogs. Farmer-feeders usually feed cattle longer and when marketing problems arose in the past, much of the problem centered on the Midwest.

Fed cattle marketings for 1978 may be 4-5 percent larger than this year. Large supplies for much of the first half of the year are already programed. Unless placement rates subside, the same fate awaits the latter half of 1978. Almost as important, heavier weights are a real possibility. Eternally optimistic cattle feeders, low feed grain prices, and more midwestern-fed cattle greatly enhance the probability of heavier weights.

Lower nonfed slaughter is anticipated. Stronger calf prices have enticed some cow-calf producers to retain replacement heifers and cull fewer old cows. With the large cow slaughter of past years, many old, less productive cows have already been culled. Although some areas of drought still exist, fewer cattle are on dry ranges and pastures than any time this year.

In terms of cattle numbers and pasture conditions, the industry is in good shape at this time. Regionally, most of the cattle that are on pastures in poor-to-fair condition or worse, are in the West and Plains. Some States in the Southeast also have experienced problems with lack of moisture. Cow slaughter for the first 9 months was 13 percent above the same period last year in the West and slightly higher in the Southeast. Slaughter of cows in all other regions was down and is expected to be down 10 percent for the United States. It appears dryness in the West and Southeast has been a major factor in keeping cow slaughter relatively high. Regionally, the July 1 distribution of the beef cow herd was: West 17 percent, Plains 38 percent, Corn Belt 18 percent, and Southeast 26 percent.

FEEDER SUPPLY

Total combined inventories of yearlings and calves outside feedlots are down. However, the decline consists completely of calves. Yearling inventories are actually about the same as last year. The drop from the previous year's level in numbers of calves outside feedlots that has prevailed since January 1976, has yet to be reflected in yearling inventories. In spite of areas of dry pastures, producers nationwide have been able to increase yearling inventories outside feedlots. In view of declining cow and replacement heifer numbers, the inference is that producers have been selling cows, keeping fewer heifers for breeding stock replacements, while holding more yearlings on pasture.

FEEDER CATTLE SUPPLY, OCT. 1

[In thousands of heads]

| Item | 1975 | 1976 | 1977 | Change, 1976-77 |
|----------------|--------|--------|--------|--------------------|
| Yearlings..... | 9,421 | 10,845 | 10,762 | -83 |
| Calves..... | 40,774 | 37,513 | 36,401 | -1,112 |
| Total..... | 50,195 | 48,358 | 47,163 | -1,195 |

Since the total feeder cattle supply actually consists of many yearlings, ample supplies to meet demand for cattle to place on feed will be available. Nonfed slaughter should be less than last year, which leaves larger numbers available for placement on feed. With substantial numbers of yearling cattle on hand, higher prices than last fall probably have resulted from stronger demand. Over the longer term, past cutbacks in calf crops, the cow herd, and replacement heifers will probably limit supplies and boost feeder cattle prices.

REPLACEMENT HEIFERS

In the past, the change in numbers of replacement heifers on hand January 1 has been a good indicator of actual additions to the herd. This year, producers intended to add 6 percent fewer heifers on January 1 and again on July 1 than the same dates a year earlier. However, a January-June balance sheet for cows points to more additions than the same period last year. Most likely, slightly more heifers will be added to the herd than last year.

As the liquidation phase of this cattle cycle ends and inventories start to build, replacement stock will become more valuable. The exact timing of price rises may depend on weather (range and pasture conditions) more than anything else.

COW INVENTORIES

Since the peak in cow numbers of July 1, 1975 at 58 million head, the national cow herd has been trimmed about 5.7 million or 10 percent. Adjustments in cow numbers originate primarily from two sources—cow slaughter and cow replacements. Over the past 2 years, cow slaughter has remained historically large while cow replacements dropped. U.S. cow numbers will likely decrease to the 50.5-51.5 million head area next year and then begin to increase by 1979. If so, the stage will be set for increases in total cattle numbers which could take place by 1980.

CATTLE HERD

The Nation's cattle herd probably shrank another 4-6 percent this year as disappearance (slaughter and death losses) remained relatively large. If anticipated levels of slaughter materialize in 1978, a more moderate drop is likely next year (assuming no major revisions in data). However, changes may already be underway that would result in the end to the liquidation phase of this cattle cycle and the beginning of an inventory expansion. Although cow-calf operators

indicated intentions to retain fewer replacement heifers this year, some evidence for the first half of 1977 suggests that more heifers entered the cow herd than the same period a year earlier. Increasing the breeding herd by retaining more heifers and reducing cow slaughter is fundamental to an expansion in total inventories.

By the outset of 1979, total inventories may be at their low point. Assuming some heifer hold-back, cow numbers will show the first year-to-year gain by 1979. This point in the cattle cycle is very important in terms of the following implications:

- Higher prices simultaneously stimulate demand for breeding stock;
- Normally, calf prices exceed yearling prices which, in turn, are greater than slaughter cattle prices;
- Supplies of ground and processed beef may be tighter than other cuts; and
- General market direction is upward.

MEAT PRODUCTION, CONSUMPTION

Combining the anticipated lower nonfed slaughter with increasing fed cattle marketings, 1978 cattle slaughter will likely decline. But heavier weights are expected to partially offset the drop in cattle slaughter. So, on a percentage basis, beef production may not drop as much as cattle slaughter. At present, beef production at 24.6 billion pounds, 2 percent less than 25 billion for the year, looks very probable.

Beef consumption for 1977 was about 125 pounds per person (carcass weight) and could decline to 122 pounds next year. However, all of this drop in beef supply will be more than offset by larger pork production. Red meat consumption in 1978 could be record large at 195 pounds per person. In addition, poultry meat will increase, possibly by 5-6 percent.

MEAT CONSUMPTION, CARCASS WEIGHT

[Pounds per person]

| Year | Beef | Pork | Veal | Lamb | Red meat |
|-----------|------|------|------|------|----------|
| 1976..... | 129 | 58 | 4 | 2 | 193 |
| 1977..... | 125 | 61 | 4 | 2 | 192 |
| 1978..... | 122 | 68 | 3 | 2 | 195 |

Large supplies of pork and poultry infer lower prices for those meats and intensified competition for beef. It may be that the relationships between substitutability between beef and pork or poultry have changed in recent years. Consumers probably are more willing to purchase other meats when beef is priced significantly above pork or poultry than was the case in the 1950's or 1960's. If this is true, then we can expect large supplies of pork and poultry to have a greater negative effect on beef prices than in the past.

DEMAND

Increases in population and consumer income over time have been very positive influences on beef prices. Beef is considered to be the

type of product that, as income rises, expenditures for beef also rise. However, since the end of the economic recession in 1975, durable goods have held a high priority in the consumer budget. The portion of total expenditures spent on food has declined over most of the last 2 years. Through 1978, consumers may tend to emphasize other portions of their budget besides food.

Cattle and beef prices have not exhibited the historical response to rising consumer income in this post-recession period perhaps because of increasing competition for the consumer's dollar. Spending for housing and automobiles has been especially strong. Large supplies of other meats provided more direct competition for beef. As a result, a change in beef supply did not provide the price response that was anticipated. There is little reason to expect the price response from lower beef supplies in 1978 will be substantially different from that in 1977.

This does not mean prices of cattle and beef will not rise. Inflationary pressures on costs will persist. Because of the structure of the cattle industry, producers cannot pass their costs on, but much of the increased cost between the producer and consumer is passed on. Subsequently, the price spread between the farm and retail level is very much effected by cost pressures.

Through the years, some of the increase in the farm-to-retail price spread has resulted from greater demand for services and convenience. This is to be expected as incomes and affluency increase. These services are added after cattle leave the farm, therefore, middlemen recoup most of the revenue from the added value. As consumers become accustomed to these changes and costs are passed on, it is not reasonable to expect a substantial decline in the costs of getting beef to the consumer.

Evolution of a fast food, convenience oriented sector in the beef industry has increased demand for specific types of beef, especially hamburger. Sources of ground and processed beef (nonfed cattle slaughter) are expected to wane in upcoming years. Less beef to meet the expanded demand infers that hamburger prices must rise, probably more rapidly than prices of more expensive cuts of beef. The price spread between hamburger and sirloin steaks has already begun to narrow and will continue to do so through the remainder of this decade.

CATTLE PRICES

For most of 1978, cattle feeders may be disappointed in slaughter cattle prices and cattle feeding profits. The effects of a moderate drop in beef consumption and rising consumer income may be largely offset by lower prices for pork and poultry and strong consumer purchasing of nonfood goods. If so, Choice slaughter steer prices could average \$41-\$43 per hundredweight. Very likely, returns to cattle feeding enterprises will be squeezed by higher costs for feeder cattle. Many times in the past, cattle feeders responded to lower feed grain costs by bidding replacement cattle prices upward. To some extent, this has already occurred and is expected to persist at least through early 1978.

Demand for feeder yearlings should be strong, mostly as low feed grain costs entice more placements of cattle on feed. Range conditions have improved so that lack of forage is not as critical as last year, giving people the option of retaining cattle for breeding purposes. Yet large yearling supplies will be sufficient to meet needs, and prices of 600-700 pound Choice steers could average in the mid-\$40's in 1978.

Calf prices are the brightest aspect of the cattle outlook. Reflecting lower calf crops since 1975, numbers of calves on farms have dropped substantially. Higher calf prices generate interest in increasing cattle numbers. Strong demand for yearlings also filters down to calf prices. Choice 300-400 pound calves are expected to average in the upper \$40's per hundredweight in 1978, with many sales in the low \$50's.

AVERAGE PRICES FOR CHOICE STEERS, UNITED STATES

[Dollars per hundredweight]

| Year | Slaughter cattle, 900-1,100 lb | Yearlings, 600-700 lb | Calves, 400-500 lb |
|-----------|--------------------------------------|--------------------------|-----------------------|
| 1975..... | 45 | 34 | 33 |
| 1976..... | 39 | 39 | 41 |
| 1977..... | 40 | 40 | 44 |
| 1978..... | Low 40's | Mid 40's | Upper 40's |

BEEF PRODUCTION AND CHOICE SLAUGHTER STEER PRICES (OMAHA)

| | Billion pounds | Price per hundredweight |
|-----------------|-------------------|----------------------------|
| 1977: | | |
| I..... | 6.3 | \$38 |
| II..... | 6.2 | 41 |
| III..... | 6.3 | 40 |
| IV..... | 6.3 | 41 |
| Year total..... | 25.0 | 40 |
| 1978: | | |
| I..... | 6.1 | 40-42 |
| II..... | 5.9 | 42-44 |
| III..... | 6.4 | 41-43 |
| IV..... | 6.2 | 42-44 |
| Year total..... | 24.6 | 41-43 |

Source: Western Livestock Marketing Information Project, November 7, 1977.

AVERAGE PRICES FOR CHOICE STEERS, UNITED STATES

[Dollars per hundredweight]

| | 600-700 lb yearlings | 400-500 lb calves |
|-----------|-------------------------|----------------------|
| 1975..... | 34 | 33 |
| 1976..... | 39 | 41 |
| 1977..... | 40 | 44 |
| 1978..... | Mid 40's | Upper 40's |

Source: Western Livestock Marketing Information Project, November 7, 1977.

OUTLOOK FOR WORLD BEEF PRODUCTION AND U.S. BEEF IMPORTS

(By John E. Riesz, Foreign Agricultural Service, USDA)

As has been stated, the U.S. herd liquidation continued throughout 1977. A similar situation has occurred to a great extent in the major beef exporting countries of Australia and New Zealand, the European Community and in neighboring Canada. These countries also have been liquidating their beef herds. In Australia where cattle numbers did not decline until 1977 beef production continued to rise in 1976 and 1977. New Zealand production increased sharply in 1976 but is expected to decline by 12 percent this year. Canadian beef output rose 8 percent in 1976 but will decline 4 percent this year. Beef production in the European Community, which peaked in 1975 has continued at a high level. Cattle prices in Australia and New Zealand fell to record low levels in 1975 and since that time price increases have not been enough to offset inflation and increased costs of production. In Australia, export quality grass fattened steers were bringing about \$14 per 100 pounds liveweight and cows around \$11 in late September—about the same as the year-earlier levels.

As world production rose the pressure to export this beef began to build. What was the reaction in the major import markets? You will recall that the Japanese and the nine-member European Community virtually stopped importing beef in 1974. Canada placed import quotas on beef and live cattle and the United States negotiated agreements with 11 major supplying countries to limit their shipments to the United States in 1975.

The situation hasn't changed much today. With intervention stocks of beef in excess of 300,000 tons, the European Community continues to be highly restrictive in its import policies. Japan has opened its market a small way but not to the extent of earlier years. Canada imposed a 1977 quota of 144.75 million pounds on imports of beef, of which 24.75 million pounds were allocated to the United States. Thus, the pressure continued on the United States, as a major import market in 1976 and 1977. However, this pressure has been somewhat lessened by large exports from Oceania to the Soviet Union and Eastern Europe.

WHAT IS THE 1978 OUTLOOK?

In 1978, we expect that production declines in the United States and Canada will be the major reasons for the second year of declining output among the traditional beef importers. On the foreign demand side, the expected decline in beef and veal production in the EC this year has not resulted in an easing of import restrictions because stock levels

of about 300,000 tons still overhang the market. For 1978, some improvement in access to the Japanese market is expected. However, the magnitude of these changes will depend upon general economic activity and its effect on consumer demand.

Large sales to the Soviets and East European countries by Australia and New Zealand have reduced stock levels and with an expected decline of over a million head in cattle numbers this year, 1978 production should drop.

Cattle inventories in Central America and the Caribbean have continued to grow this year and as a consequence potential exports to the United States in 1978 will be about 10 percent larger than expected 1977 shipments.

Aside from the major import markets (i.e. United States, Canada, the EC, and Japan) the Soviet Union has in the past 2 years been an opportunistic purchaser of beef and veal on world markets, buying at the lowest price. This year the Soviets have purchased boneless beef in contrast to previous bone-in purchases and have paid prices which at times were above those quoted for sales to the U.S. market. A continuation of sales to the Soviets in 1978 would be a major as yet undefined factor in the world's beef supply and demand situation.

The administration is now considering its meat import policy for 1978. The policy options under consideration will include a continuation of the restraint program with supplying countries to limit imports into the U.S. market to a specific level.

I would like to point out that the meat import law sets a quota level and a trigger level for the quantity of meat—mostly frozen boneless beef—that may be imported in any one calendar year. For example, this year the formula in the law sets the quota at 1,165 million pounds and allows a 10 percent overage to a trigger point for the imposition of quotas at 1,282 million pounds.

There seems to be some misinformation about what the President and the Secretary of Agriculture can do with respect to the law. First, the President may not reduce imports below the quota level in the law, that is, this year below 1,165 million pounds. Second, if the Secretary of Agriculture's estimate of imports in the absence of restraints is expected to exceed the trigger quantities set forth in the law, the President must invoke quotas. He may then suspend them under certain conditions specified in the law. Another policy option open to the President is to negotiate a program of voluntary restraints to keep imports below the trigger level specified in the law. Most Presidents have chosen this option in the past because it is more consistent with our international trade obligations under the General Agreement on Tariffs and Trade than is the imposition of quotas.

These Voluntary restraint agreements are negotiated and enforced under the authority of section 204 of the Agricultural Act of 1956. The U.S. Government can take action under section 204 to limit imports to the agreed levels. Such action has already been taken this year to limit imports from Costa Rica. Some of you probably do not agree with a policy which permits a certain level of beef imports. However, a complete embargo of beef imports is not possible given the current

meat import law. It would require a change in the law to embargo imports.

In contrast to the highly restrictive practices of other major beef importing countries the United States again chose to negotiate voluntary restraint agreements in 1977 at the level of 1,271.9 million pounds. These agreements have been operating well this year. For instance, through October 29, 83 percent of the year, we have imported 1,023 million pounds, or 80 percent of the total. Thus, it appears we are right on target. The problem of superficially processed beef which was such a hot issue last year when we met has been completely covered under the voluntary restraint program in 1977.

As you know, we are the largest exporter of agricultural products in the world. We exported about \$24 billion of agricultural products in fiscal year 1977 while imports exceeded \$13 billion for a positive balance of trade of almost \$11 billion. In fiscal year 1977 we exported \$2.2 billion in livestock and livestock products; about 10 percent of our total agriculture exports. Our major export items were hide and skins, tallow and variety meats. Livestock product imports in 1977 amount to \$1.9 billion. Our major import item was, of course, red meat, primarily beef.

For 1978 we are projecting imports at \$2.1 billion; up slightly from the 1977 levels. Increased unit values of beef will be the major factor.

In fiscal year 1978, we are looking for a slight decline in livestock product exports to about \$2 billion. We are expecting a decline in animal fat exports, due to the large competing world oilseed crop and we also are looking for some decline in pork exports. We expect to increase our beef exports to about \$130 million; an increase of 15 percent over 1977.

MEAT ANIMAL OUTLOOK

(By Ewen M. Wilson, Director of Economics and Statistics, American Meat Institute)

I would like to direct my comments into two subheadings. First, those relating to supply. Second, those relating to demand.

Supply.—Next year we will see a further decline in beef production, and a shift in the beef mix toward more fed, Choice-style beef, and less non-fed hamburger type beef. Plentiful hamburger beef in the past 3 years was largely a consequence of herd liquidation resulting from adverse profits. That is now changing; our feedlots are filling up again, more Choice beef is on the way. Pork production is also headed for a substantial increase. The hog-corn ratio has been running above 20 since June, providing encouragement to hog producers to expand operations. Farrowing intentions and reports of gilt withholding indicate that expansion is proceeding at a rapid pace.

I agree with Jim Nix that declining feed grain prices have been a significant factor in shaping the outlook for livestock. If anything, the past few years have been characterized by distortions of relative prices from historical norms. Crop prices, boosted by export demand and depleted U.S. reserves, rose both in an absolute sense and also in relation to livestock prices. In 1974 the index of prices received by farmers for feed grains had risen 150 percent above its 1967 level. The price index for meat animals, by comparison, was only 65 percent over its 1967 level. In other words feed grain prices had risen at more than double the pace of livestock prices. That was the predominant factor in adverse profits in the cattle sector and a reason why in 1975 commercial pork production slumped below the low of 1958.

Today of course we are looking at alltime record corn and soybean harvests and at prospects for substantial additions to carryover in the 1977-78 marketing year. That will keep feed prices down and encourage cattle feeding and hog expansion.

One of the consequences of relatively high feed grain prices has been a heavy rate of liquidation of the cattle herd. If Jim Nix is correct and the January 1, 1978 cattle count comes out at 117.3 million then the decline in numbers since January 1, 1975 would be 11 percent. That's a far more severe adjustment than occurred in the past two cattle cycles. The 1965-67 adjustment was less than 1 percent. The 1956-58 adjustment was about 5 percent. The last time such drastic liquidation occurred was back in the 1945-49 period when 10 percent of the cattle herd was slaughtered. Even so, that was a 10 percent adjustment in 4 years; here we are looking at an 11 percent adjustment in 3 years.

The sheer magnitude of the 1975-78 liquidation provides the most encouraging prospects for cattle producers that we've seen for some time. However, I would agree with Jim Nix that a dramatic turnaround is unlikely. Increased pork supplies in 1978 will put pressure on prices both in the pork and cattle sectors. Jim suggests a 88 million head commercial hog slaughter in 1978, a 13 percent increase. That's about 68 or 69 pounds per capita.

Demand.—Sluggish demand has been a pervasive factor in low cattle sector profits and has contributed to lackluster retail and farm level prices. Probably the one thing that would help the whole livestock and meat sector more than anything else at the moment is some evidence of stronger demand. According to data that we compute at the American Meat Institute, gross packer margins in 1977 for both cattle and hogs have been running behind year earlier levels. For instance, in the January-October 1977 period the gross margin for hog slaughtering plants was 17 percent narrower than for the comparable year earlier period. At the same time packers are facing higher costs than they did a year earlier, particularly for labor and energy. Higher costs and lower margins are causing losses among many of them. That's why several Midwestern packers shut down plants in the past month. Unless we see some improvement in demand the malaise of the livestock and meat sector is likely to continue.

One area that has been difficult to analyze and is proving confusing in a projection sense is the relative levels of demand for Choice type versus hamburger type beef. As indicated earlier there has been an obvious supply phenomenon; the volume of nonfed steer and heifer slaughter and cow slaughter which comprises lower quality grade hamburger beef increased relative to fed Choice style beef during the liquidation phase of the cycle. But increased hamburger supplies were not accompanied solely by a movement down the demand curve. Rather there appears to have been a shift in the demand curve so that increased supplies were absorbed by the market at a higher price than otherwise would have occurred. Part of this is explained by income and population growth, but not all of it.

In fact if you look at Choice beef, the population and income effects appear to have been outweighed by other effects. In 1972 we consumed more Choice quality beef than we did in 1975, 1976, and 1977. The so-called law of demand says that the lower quantities consumed should have been taken from the market at a higher price; a move along the demand curve. In actual fact, the lower quantity of fed beef in the last 3 years has cleared the market at a lower real price. In other words, it appears that here has been a negative shift in demand for Choice beef and a positive shift in demand for hamburger beef.

The big question today: as we move out of the liquidation phase of the cycle toward more fed, less nonfed beef what is going to happen to demand? If the new demand mix stays with us, then we will see substantially higher hamburger prices and rather unresponsive Choice beef prices. However, I believe we are more likely to see a partial shift back towards the old demand characteristics. This implies a more moderate rise in hamburger prices and some strengthening in Choice beef prices.

Finally, a few comments about pork. Pork is going to be a good buy in 1978. Supplies are increasing, prices declining and we are looking at a much leaner product than in the past; an important consideration in today's health conscious market. One area of extreme concern in the pork sector is the issue of nitrites and nitrosamine formation. Adverse publicity has already had a negative demand and price effect. The pork bellies market has been particularly responsive to the scare reaction triggered by nitrosamine publicity. It happened in the fall of 1975, it happened again last month. The USDA notice on nitrites caused belly holdings to devalue overnight. The industry, quite naturally does not like these transitory losses. The full effect of an actual nitrite ban would, however, be far more serious. A ban would be disastrous to the pork sector and would have serious consequences in allied livestock and grain industries.

The immediate concern is not so much with the likely effect of a nitrite ban. A ban seems unlikely; scientific evidence does not support it. The immediate concern stems, rather, from the negative demand impact resulting from adverse publicity. I am not sure how significant this demand effect is (it is difficult to measure), but it compounds the effects of increasing supplies on a downward market trend.

Thus resolution of the nitrite issue is in the interest of the livestock sector.

OUTLOOK FOR TIMBER PRODUCTS

(By Robert B. Phelps, Forester, Forest Service, USDA)

The demand for timber products is largely determined by the levels of activity in several important end-use markets. So, before discussing demand for the various products, I would like to briefly review trends in the economic situation affecting these markets and take a look at current estimates of their strength this year and early in 1978.

DOMESTIC MARKETS

A major determinant of the demand for many timber products is construction activity, and most particularly, residential construction activity. As most of you know, housing is the Nation's most important market for softwood lumber and plywood, and a major consumer of many other timber products such as hardwood plywood, particleboard, and insulation board. And not only is it a large direct consumer of wood, but it provides the stimulus for homeowner purchase of many manufactured goods, including household furniture. Furniture production, of course, is a key manufacturing use of hardwood lumber, plywood and veneer, hardboard, and particleboard.

In 1975, starts of new housing units dropped to 1.17 million units, the smallest yearly total since just after World War II. The lowest monthly construction rates were early in the year, however, and since that time, housing construction has been increasing. Total starts in 1976 were up nearly a third to 1.55 million units. This year, after dropping sharply in January due to the extreme cold weather, the increase has continued. Preliminary data indicate the seasonally adjusted annual rate of new housing starts during the first three quarters of 1977 was just over 1.9 million units. This represented an increase of more than 30 percent from the similar period in 1976. Almost three-fourths of the units started so far in 1977 have been single family. This of course, has special significance for the timber industries because wood products use in those units is normally much larger than in other types of housing.

Building permits, an indicator of future starts, are also above year-earlier levels. Through the first 9 months of 1977, about 1.3 million permits were issued, over a third more than in the same period in 1976. These too, have been heavily weighted toward single-family units, though somewhat less so than last year.

Shipments of mobile homes have been recovering slowly from the low of 2 years ago. Through the first 8 months of this year shipments have equaled an annual rate of 260,000 units—about 5 percent above the total for 1976.

Despite the strong upward trends, however, there have been recent indications that housing construction activity may flatten out somewhat late this year and show a small drop in 1978. In late summer interest rates were moving up and the inflows of funds into the major mortgage lending institutions were down sharply from early fall, 1976. In addition, prices of new houses were continuing to rise, and some shortages of materials and labor were being reported.

Based on trends for the year and on these various factors, most housing analysts now expect that housing starts for 1977 will total about 1.9 million units, some 23 percent more than in 1976 and almost two-thirds above the low of 1975. They also expect that about three-fourths will be single-family units. As a consequence, 1977 will likely be a record year for one-family construction, surpassing the previous high of 1.3 million units constructed in 1972.

Some additional slowing is expected in 1978 if credit conditions continue on their present course. As a result most forecasts indicate a decline in total starts to about 1.7 to 1.8 million units. A slightly smaller proportion of single-family starts is also expected.

Expenditures for residential upkeep and improvements have been rising in 1977 as many homeowners apparently met their needs for additional space by alterations and remodeling rather than purchase of new homes. This long-time upward trend can probably be expected to continue.

In contrast to housing, private nonresidential construction activity (measured in 1972 dollars) has shown only limited recovery from the declines of 1974 and 1975. At the end of the first 8 months of this year private nonresidential building construction is slightly ahead of year-earlier rates, led primarily by office and religious buildings. On the other hand, construction of private and public educational and hospital facilities are still below 1975 and 1976 levels. In late summer, surveys of anticipated increases in expenditures for plant and equipment indicated some rise in last quarter construction. However most analysts expect any increases to come only slowly, and for spending to remain sluggish in early 1978.

Industrial production—an important indicator of the demand for pallet lumber, container board, and some grades of paper—has been rising and after the first 8 months of 1977 the index was about 6 percent above the average for 1976. Container production, a large market for paperboard, hardwood, veneer, and some grades of lumber, was following the same trend.

Production of furniture and fixtures—an important market for hardwood lumber, plywood and veneer, particleboard, and hardboard—was about 6 percent above 1976 at the end of the first 7 months of 1977. The trend in furniture and fixtures output was presumably, in part, due to the rise in housing construction. Many industry analysts feel that trends in furniture sales lag new housing sales by about 6 months. Thus, current housing trends indicate a possible further rise in the months ahead with some leveling off in 1978.

INTERNATIONAL MARKETS

The United States is the world's leading importer of timber products—chiefly lumber, woodpulp, and paper and board from Canada

and veneer and plywood from Southeast Asia. The total value of these imports in 1976 was \$5.5 billion or about 5 percent of the value of all U.S. imports. In terms of roundwood equivalent, about a fifth of our apparent consumption of timber products have been imported in most recent years.

The United States is also a major timber products exporter. In 1976, the total value of timber product exports was \$4.7 billion. Although we ship a variety of wood products to many countries, our principal export markets are Japan for softwood logs and lumber, pulp chips, woodpulp, and paper and board products, and Western Europe for woodpulp, paper and board products, and smaller amounts of lumber and plywood.

International demand for U.S. timber products grew rapidly in the early 1970's. However, in 1974 and 1975, it declined sharply as economic conditions slowed in the principal importing areas. In the Western European countries and in Japan, housing construction as well as consumer demand dropped. In both areas, timber product inventories rose to relatively high levels. Although the economic recession in most of these countries reached bottom during 1975 and conditions have been improving since then, the increases have been slow, particularly in the European markets. Current estimates are for slow to moderate growth in domestic requirements in late 1977 and 1978 in Europe. Demand in Japan, at least for some wood products has also slowed, and housing starts for 1977 are expected to be below 1976 levels.

SOFTWOOD LUMBER

In response to the generally increased activity in its major markets, particularly housing, softwood lumber production through the first 8 months of 1977 has been somewhat above the levels attained in 1976. For example, data published by the National Forest Products Association show that output through August was about 5 percent above production in the similar period in 1976. Current expectations about housing and other markets in the final quarter of 1977 indicate that production will likely slow somewhat in the final quarter and total about 32 billion board feet for the year, some 4.3 percent above 1976 and a record volume for recent years (table 1).

Data from the first 8 months of the year indicate that softwood lumber imports are likely to rise sharply to about 10.5 billion board feet in 1977, nearly a third above 1976 shipments and about 16 percent above the previous record levels of 1972 and 1973. As has been true in recent years, nearly all of this will come from Canada. Exports are expected to be about the same as the 1.6 billion board feet shipped in 1976.

Based on the estimates of production, imports, and exports discussed above, apparent consumption (i.e., production plus imports minus exports), is estimated at 40.9 billion board feet—about 11 percent above 1976 and also record volume. If housing construction drops to 1.7 to 1.8 million starts in 1978, and the other major markets perform as discussed earlier, consumption is likely to decline somewhat. Production and imports are also expected to drop.

TABLE 1.—WOOD PRODUCTS PRODUCTION, CONSUMPTION, AND TRADE (1975 AND 1976 ACTUAL, 1977 AND 1978 PROJECTIONS)

| Product and year | Domestic production | Imports | Exports | Apparent consumption |
|--|---------------------|---------|---------|----------------------|
| Softwood lumber (billion board feet): | | | | |
| 1975 | 26.7 | 5.7 | 1.4 | 31.1 |
| 1976 | 30.5 | 8.0 | 1.6 | 36.9 |
| 1977 | 32.0 | 10.5 | 1.6 | 40.9 |
| 1978 | 31.0 | 9.0 | 1.7 | 38.3 |
| Hardwood lumber (billion board feet): | | | | |
| 1975 | 5.9 | .2 | .2 | 5.9 |
| 1976 | 6.4 | .3 | .2 | 6.5 |
| 1977 | 6.6 | .3 | .2 | 6.7 |
| 1978 | 6.8 | .4 | .2 | 7.1 |
| Softwood plywood (billion square feet, $\frac{3}{8}$-in basis): | | | | |
| 1975 | 15.7 | (1) | .8 | 14.9 |
| 1976 | 17.8 | (1) | .7 | 17.1 |
| 1977 | 18.4 | (1) | .4 | 18.1 |
| 1978 | 18.2 | (1) | .5 | 17.8 |
| Hardwood plywood (billion square feet, $\frac{3}{8}$-in basis): | | | | |
| 1975 | 1.2 | 1.9 | .1 | 3.1 |
| 1976 | 1.4 | 2.4 | .1 | 3.7 |
| 1977 | 1.6 | 2.3 | .1 | 3.8 |
| 1978 | 1.6 | 2.3 | .1 | 3.8 |
| Particleboard² (billion square feet, $\frac{3}{4}$-in basis): | | | | |
| 1975 | 2.6 | (1) | .1 | 2.5 |
| 1976 | 3.2 | (1) | .1 | 3.2 |
| 1977 | 3.7 | .1 | .1 | 3.7 |
| 1978 | 3.4 | .1 | .1 | 3.4 |
| Hardboard (million tons): | | | | |
| 1975 | 1.8 | .1 | .1 | 1.8 |
| 1976 | 2.1 | .2 | .1 | 2.4 |
| 1977 | 2.2 | .2 | .1 | 2.4 |
| 1978 | 2.2 | .2 | .1 | 2.4 |
| Insulation board (million tons): | | | | |
| 1975 | 1.2 | (3) | (3) | 1.2 |
| 1976 | 1.4 | (3) | (3) | 1.4 |
| 1977 | 1.4 | (3) | (3) | 1.4 |
| 1978 | 1.4 | (3) | (3) | 1.4 |
| Pulpwood (million cords): | | | | |
| 1975 | 69.0 | .7 | 2.5 | 67.2 |
| 1976 | 77.9 | 1.0 | 3.1 | 75.8 |
| 1977 | 80.5 | 1.1 | 2.9 | 78.7 |
| 1978 | 81.9 | 1.2 | 3.0 | 80.0 |

¹ Less than 50,000,000.

² Includes medium density fiberboard.

³ Less than 50,000.

Note: The projections presented for 1977 and 1978 are based on the trends in the major markets discussed in this paper and should not be viewed as forecasts of actual volumes. Data presented are subject to rounding.

Primarily because of the record level of demand, softwood lumber prices have increased sharply in 1977. By September, the wholesale price index for all softwood lumber was 328.3 (1967=100) (table 2). This was about 18 percent higher than the index in January and almost a third above the average for 1976. Much of the rise came in late summer. Early in September, however, prices began to drop and by October the wholesale price index was 316.4, a decline of 4 percent from the September high. Some additional softening is likely if demand drops in the months ahead.

HARDWOOD LUMBER

The rising activity in the container, pallet, and furniture industries, and the somewhat larger use of crossties by the railroads, suggests the likelihood of an increase in hardwood lumber demand in 1977. As a consequence, production for the year is estimated at 6.6 billion board feet—3 percent more than in 1976.

TABLE 2.—WHOLESALE PRICE INDEXES FOR SELECTED WOOD PRODUCTS
[1967=100]

| Product | 1975 annual | 1976 annual | 1977 | |
|----------------------------------|----------------|----------------|-----------|---------|
| | | | September | October |
| Softwood lumber..... | 200.6 | 248.1 | 328.3 | 316.4 |
| Hardwood lumber..... | 160.3 | 176.0 | 205.9 | 206.2 |
| Softwood plywood..... | 200.6 | 247.4 | 332.8 | 314.6 |
| Hardwood plywood..... | 119.5 | 122.5 | 129.8 | 130.3 |
| Particleboard ¹ | 90.0 | 97.3 | 127.0 | 127.2 |
| Hardboard ² | 117.7 | 131.4 | 143.1 | 146.1 |
| Insulation board..... | 144.0 | 160.8 | 185.2 | 187.1 |

¹ Corestock.² Type II, ½-in.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Unlike the situation for softwoods, hardwood lumber imports during the first half of 1977, were close to the levels in the first two quarters of 1976. The total for this year is thus estimated at 0.3 billion board feet, the same as last year. First half data also showed that exports were near year-earlier levels. The total for 1977 is therefore expected to be about 0.2 billion board feet, also equal to that shipped in 1976.

Apparent consumption of hardwood lumber in 1977, based on the estimates of production and trade given above, should amount to about 6.7 billion board feet, 3 percent above 1976. Continued slow growth in the hardwood lumber markets pointed out earlier, suggests a further increase in demand in 1978, although it is unlikely that consumption will rise to the level reached in 1973 and many prior years.

In contrast to softwoods, hardwood lumber prices, as measured by the wholesale price index, have been increasing relatively slow in 1977, probably in response to the slow rise in demand outlined above. Prices in October were about 10 percent above January, 4 percent less than the increase for softwood lumber. If demand continues to improve as discussed earlier, prices may well continue to increase slowly late this year and in 1978.

SOFTWOOD PLYWOOD

According to data published by the American Plywood Association, total production of softwood plywood in the first 8 months of 1977 was 13.2 billion square feet (¾-inch basis). This is 5 percent above production in the comparable period in 1976 and undoubtedly reflects the strength in the major markets, particularly housing. Based on the likelihood of continued, though somewhat slower demand in the last quarter of the year, softwood plywood production for 1977 is estimated at 18.4 billion square feet, up about 3 percent from 1976 and a record level of output.

Exports of softwood plywood, which have been slowly rising in recent years, are sharply down in 1977 and are expected to total only about 0.4 billion square feet, some 43 percent below exports in 1976. Imports will remain relatively insignificant.

Apparent consumption in 1977 is therefore estimated at 18.1 billion square feet, also a record. In addition to its increasing use in the housing market in 1977, softwood plywood use has been up in maintenance and improvements and in several important manufacturing uses. These

markets are expected to partially offset any declines in housing use and as a consequence softwood plywood consumption will likely be down by only a small amount in 1978.

The wholesale price index indicates that softwood plywood prices in 1977 have followed the same general trends as those for softwood lumber; that is, rapid increases in response to the high levels of demand through September. Softwood plywood prices have also been declining in recent weeks and the October wholesale index shows a drop of over 5 percent since the high reached in September. Some further decline is probable if housing construction slows in the weeks ahead.

HARDWOOD PLYWOOD

Hardwood plywood production has been rising since 1975, and in response to the large numbers of housing units built and the increase in the strength of manufacturing, production in 1977 is expected to total about 1.6 billion square feet ($\frac{3}{8}$ -inch basis), some 14 percent above 1976.

Data for the first half of 1977 indicate that imports are likely to total about 2.3 billion square feet. Exports are expected to remain at the 1976 level of 0.1 billion.

Given these trends in production and trade, apparent consumption of hardwood plywood in 1977 is estimated at 3.8 billion square feet, up 3 percent from 1976. Little change in consumption is expected in 1978 if the various markets continue as discussed earlier.

Hardwood plywood prices, historically much less volatile than those for softwood plywood, have exhibited a small increase in the first 10 months of this year. Despite this rise, the wholesale price index for October was only 5 percent above the average for 1976, and still 2 percent under the index in October 1974. The relative wholesale price index for hardwood plywood (a measure of its price relative to all wholesale commodities) was 66.4 (1967=100), very probably near the all-time low. A continued slow upward movement in prices can be expected in 1978 if the major markets continue to improve.

PARTICLEBOARD

Particleboard production in 1977 is expected to be up about 16 percent to 3.7 billion square feet ($\frac{3}{4}$ -inch basis). Data for the first half of the year suggest that imports are likely to rise to about 0.1 billion square feet and that exports will remain unchanged at the same volume. Consumption is thus estimated at 3.7 billion square feet, also 16 percent above 1976. These increases are primarily a reflection of the situation in housing—the market for large volumes of particleboard used for underlayment under carpeting and for subflooring in mobile homes—and in furniture manufacture. Expected slowing in the demand for housing makes a somewhat lower volume of production and consumption likely in 1978.

HARDBOARD AND INSULATION BOARD

Hardboard production in 1977 is estimated at about 2.2 million tons (about 7.5 billion square feet, $\frac{1}{8}$ -inch basis), 5 percent above 1976.

Imports and exports are expected to total 0.2 and 0.1 million tons, respectively, the same volumes as in 1976. Consumption with these estimates of production and trade would amount to 2.4 million tons (approximately 8.3 billion square feet), up about 4 percent.

Data for the first half of 1977 indicate that insulation board production for the year will total about 1.4 million tons (3.2 billion square feet, 1½-inch basis)—the same as in 1976. Imports and exports are expected to be under 0.1 million tons. Therefore, consumption is estimated at 1.4 million tons, also the same as last year.

If housing and manufacturing output follow the trends outlined earlier, the demand for both hardboard and insulation board will probably show little change in 1978.

PULPWOOD

According to data from the American Paper Institute, production of paper and paperboard in the first three quarters of 1977 was at an annual rate of about 61.7 million tons, 2 percent above production in 1976 and very near the historic high reached in 1973. As a consequence, production of woodpulp—which currently constitutes about 77 percent of the raw materials consumed in U.S. paper and board mills—also rose to record levels, as did the pulpwood used for its production. Although industry data indicate that paper and board production has shown some recent slight decline, woodpulp and pulpwood production are likely to continue at relatively high levels for the remainder of the year. Based on these factors, pulpwood production (roundwood and chips) for 1977 is estimated at 80.5 million cords, 3 percent above 1976 and only 1 percent below the high reached in 1974.

Imports of pulpwood are expected to total about 1.1 million cords and exports approximately 2.9 million. These volumes are, respectively, 5 percent above and 7 percent below 1976. The drop in exports reflects an estimated 8 percent decline in chip exports.

Pulpwood consumption in 1977, given the above estimates of production and trade, amounts to 78.7 million cords, some 4 percent more than in 1976. Prospective increases in economic activity and some additional rise in manufacturing suggest that upward trends in pulpwood production, consumption, and trade will continue in 1978.

SOFTWOOD LOGS

Softwood log exports through the first three quarters of 1977 amounted to about 2.3 billion board feet, the bulk of these shipments moving from the Pacific Coast States of Washington and Oregon to Japan. Current conditions of over-supply in that country, coupled with the housing outlook for the remainder of the year, suggests that their imports of softwood logs are not likely to rise above year-earlier levels in the last quarter. Exports for the year have therefore been estimated at 3 billion board feet—about 5 percent below shipments in 1976. A slight increase is expected in 1978. Imports of softwood logs have been slowly rising since 1973 and are expected to total about 0.1 billion board feet in both 1977 and 1978.

HARDWOOD LOGS

Hardwood log exports in 1977 are estimated at 0.1 billion board feet, about the same as in 1976. Although the volume is relatively small, many of the logs are walnut, high quality oak, and other preferred species that are in short supply in the United States. Thus exports have been an important contributing factor to the large increases in stumpage and log prices for these species. Hardwood log imports have been dropping rather steadily since the mid-1950's and are expected to total only 10 to 15 million board feet in 1977. There will probably be little change in imports or exports in 1978.

SUMMARY

Given the trends in consumption, trade, and production for the various products discussed earlier, U.S. production of industrial roundwood products (i.e., the round timber equivalent of all products except fuelwood), is expected to rise to about 11.8 billion cubic feet in 1977. At this level, output would be 3 percent above 1976 and about equal to the record volume produced in 1973. Total imports, including the pulpwood equivalent of pulp, paper and board is likely to increase to about 3.1 billion cubic feet, 14 percent more than in 1976. Exports, on the other hand, are expected to remain at about the level of last year. With these volumes of production and trade, total apparent consumption will be 13.5 billion cubic feet, also about the same as in 1973. A small decline in consumption, imports, and production can be expected in 1978 if the various markets, particularly housing, behave as discussed earlier. A rise in exports is likely if the economies of our major trading partners continue to improve in the months ahead.

OUTLOOK FOR DAIRY

(By Charles N. Shaw, Agricultural Economist, Economic Research Service, USDA)

The dairy situation in 1977 has continued to undergo numerous changes. This was a year which saw another large increase in milk production, a substantial increase in the support price for manufacturing grade milk which brought farm milk prices slightly above the strong 1976 market levels, decreased sales of dairy products, and sharp increases in Government purchases and uncommitted inventories of dairy products. During the coming year, many of these conditions are likely to persist and in some cases worsen. I will discuss these factors in more depth after reviewing the major dairy provisions in the recently enacted legislation.

DAIRY PROVISIONS IN THE FOOD AND AGRICULTURE ACT OF 1977

The 1977 act provides that the price of milk be supported at not less than 80 percent of parity through March 31, 1979, after which the Secretary of Agriculture can support milk at a level between 75 and 90 percent of parity, as required by permanent law.

Second, the support price is to be adjusted by the Secretary on a semiannual basis through March 31, 1981, to reflect any estimated change in the parity index. Quarterly adjustments in milk price supports are permitted but not required. With the new October 1 marketing year, the semiannual adjustment will occur on April 1 and actually will insure the higher support level through September 1979.

While these two provisions are probably most important in determining the short-run outlook for dairy, other provisions expanded the dairy indemnity program, continued the authorizations relating to Class I base plans and seasonal incentive plans under milk marketing orders and the donation of dairy products to the military and veteran's hospitals, and required the Secretary to issue USDA standards for ice cream which he has issued.

MILK PRODUCTION CONTINUES HEAVY

Milk production, which moved above year-earlier levels in October 1975, has continued to increase strongly in 1977 and may exceed 123 billion pounds for the year. The current expansion may well be the longest continuous one on record.

Most of the impetus for the increased production has come from favorable milk-feed price relationships and the resulting heavier concentrate feeding and 3-percent increase in output per cow.

The decline from a year earlier in milk cow numbers has remained very close to a half percent thus far in 1977. This decline has been slowed by the relatively favorable conditions for milk production and the continued large numbers of heifers entering the milking herd.

Milk production in July–September was about 2.8 percent above a year earlier, following a similar gain during the first half of the year. The increases during 1977 have been widespread as all regions except the Plains States have posted gains—with substantial gains in the important Lake States, Northeast, and Pacific regions.

Farmers fed almost 6 percent more concentrates on October 1 this year than in 1976. Dairy ration costs were well below a year ago in October and likely will average lower than a year earlier during the barn feeding season. Coupled with expected higher milk prices, milk-feed relationships likely will be more favorable for dairy farmers during the first half of 1978 than in early 1977. The milk-feed price ratio (pounds of concentrate ration equal in value to 1 pound of milk) stood at 1.84 in October, well above last year and the highest since December 1971. Hay costs are lower than last year although supplies are tight and prices high in some areas.

MORE MILK LIKELY IN EARLY 1978

Milk production likely will remain well above year-earlier levels in early 1978, as many of the forces which shaped this year's increase will continue. Strong gains in output per cow probably will more than offset moderate declines in cow numbers.

Milk production later in 1978 will depend on milk prices and cull cow prices, as well as on crop conditions and subsequent feed prices and feeding rates. Continued heavy concentrate feeding is expected with strong gains in output per cow. Culling rates could also increase and offset the gains in output per cow—resulting in milk production stabilizing at a slightly lower level. Production costs other than feed likely will continue to increase. All factors considered, milk production in 1978 likely will show an increase of 1–2 percent.

FARM MILK PRICES TO INCREASE IN 1978

Farm milk prices have averaged slightly above year-earlier levels during most of 1977, after running below during the first quarter of the year. Heavy supplies of milk and dairy products and sluggish sales have limited seasonal rises in farm milk prices. Farmers received an average \$10.10 per 100 pounds of milk in October, up 76 cents from May but only 14 cents above a year ago. Manufacturing milk prices were about 18 cents below the \$9 support level, when adjusted to annual average fat test. Although farm milk prices probably will close out the year well above a year ago, milk prices for all of 1977 likely will average close to \$9.70, up only about a nickel from 1976. Total cash receipts from dairying could reach \$11.8 billion, up from \$11.4 billion last year.

Even with the expected heavy supplies, farm milk prices in early 1978 will average considerably above a year earlier due to the higher support price. Prices later in the year will depend largely on milk production and commercial sales of dairy products, but the average for all of 1978 will be considerably above 1977.

Wholesale butter and cheese prices have remained near the support level since adjusting to the increased support prices effective April 1. Even with the peak holiday demand period approaching, it is unlikely that any substantial price increases will occur in the next few months and wholesale prices likely will remain near support at least through next year's flush production season.

Retail prices of milk and dairy products leveled off in early summer before increasing slightly in recent months. Prices of milk and dairy products in the grocery store probably will rise only slightly in the next few months and, for the year, likely will average only 3-4 percent above 1976. However, the increase from a year earlier will likely widen slightly in early 1978 as both farm milk prices and marketing costs are higher and the average for all of next year could be 5-6 percent above this year.

DAIRY SALES DOWN

Sales of milk and dairy products have been sluggish thus far in 1977, despite the very moderate increase in retail prices. Even though strong this summer, total dairy sales during the first 9 months of the year were down over 1½ percent from the corresponding period in 1976. Unlike previous years when larger cheese sales offset declines in sales of other dairy products, commercial disappearance of American cheese this year has been down just over 1 percent, while sales of other cheese were only up about 2½ percent. Butter and nonfat dry milk are both down over a tenth and ice cream sales are down nearly 2 percent. Moderate increases in dairy sales may occur next year, particularly if cheese sales are helped by continued rises in consumer purchasing power and expected increases in beef prices.

Per capita civilian consumption of dairy products in 1977 will be just slightly lower than 1976's 548 pounds milk equivalent. Lower sales were largely offset by larger Government donations. Per person use in 1978 may increase if sales recover as expected. With the large CCC supplies, Government donations probably will be at least as large as this year.

COMMERCIAL DAIRY STOCKS LARGE

Commercial dairy stocks are still ample although down somewhat from earlier this year. On October 1, commercial holdings were down about 5 percent from last year's high level. Commercial stocks of American cheese were down about 2 percent, while butter stocks were down about a fifth from last year's relatively high level. Manufacturers' stocks of nonfat dry milk remained heavy in relationship to the reduced level of sales.

USDA PURCHASES HEAVY—INVENTORIES LARGE

USDA purchases of dairy products under the price support program have been heavy this year. The equivalent of 6 billion pounds of milk was removed during the first 10 months of 1977, compared with only a quarter billion pounds a year earlier. This year's removal rate was the highest since 1967. Among the individual products, removal of butter, cheese and nonfat dry milk have all been heavy. CCC

purchases are likely to continue heavy at least through next year's flush production season as the increased milk output likely will continue to outstrip demand.

Once the CCC has purchased the products, how are they going to encourage larger use through restricted donation outlets? On November 1 Government uncommitted inventories of American cheese were 69 million pounds compared with none a year earlier and the highest level on that date since 1967. Butter inventories at 163 million pounds were the largest since 1963, and nonfat dry milk inventories at 645 million pounds, were up nearly two-thirds from last year. With the expected increase in purchases and restricted donation outlets, uncommitted inventories will continue to increase. By the end of the current marketing year (September 30, 1978) uncommitted inventories of butter and American cheese could more than double, while nonfat dry milk inventories could be approaching a billion pounds. Obviously, we need to move more surplus products.

IMPORTS UP SLIGHTLY

January–September imports this year were slightly above 1976 levels. About 1.3 billion pounds milk equivalent were imported in the first 9 months, up from 1.2 billion last year, as higher cheese imports provided most of the increase. Cheese import quotas are being more fully utilized this year than in 1976. The relationship of domestic prices to world trading prices (some of which are subsidized) continued to make the United States a fairly attractive market, despite the domestic surplus.

Commercial exports of dairy products remained small this year. However, substantial amounts of nonfat dry milk have been donated under the Food for Peace Program—even though well below many earlier years. The export donations are expected to continue through at least the current marketing year.

The United States is not the only country with a surplus as output has remained heavy in Western Europe. Year-to-year increases of 8 to 10 percent in EC milk deliveries this summer resulted in a 9-month total about 2 percent above a year ago. The situation in other West European countries has varied, but milk production has generally been strong. New Zealand's milk output was a record in 1976–77, while Australia and Canada have successfully reduced production.

The diversion of EC milk from butter-powder production to meet the strong cheese demand has helped limit intervention stocks. Even so, these holdings totaled about 426 thousand metric tons of butter and over a million tons of nonfat dry milk on September 1. Despite the relative restraint in increasing foreign support prices this year, world dairy markets are still very much glutted and no long-term solution is in sight.

SUMMARY

Next year likely will be one of increased production, higher farm milk prices, and heavy Government purchases, as surplus conditions persist. We can hope for some increase in sales of dairy products but ways must be found to bring supply and demand more closely in balance in future years.

CURRENT SITUATION CHARTS

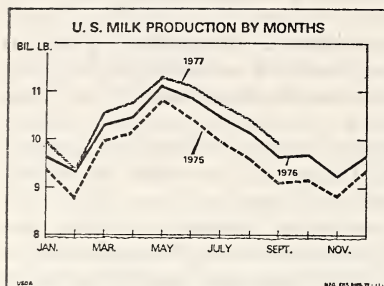


Figure 1

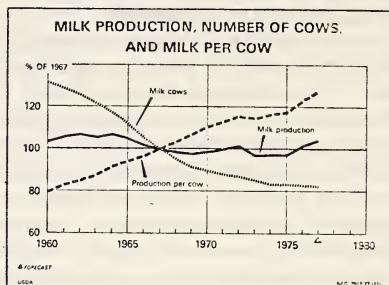


Figure 2

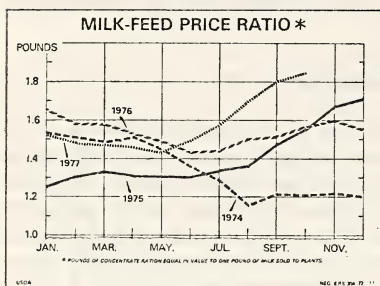


Figure 3

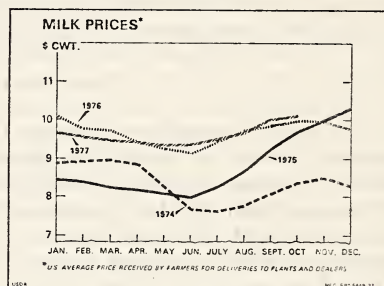


Figure 4

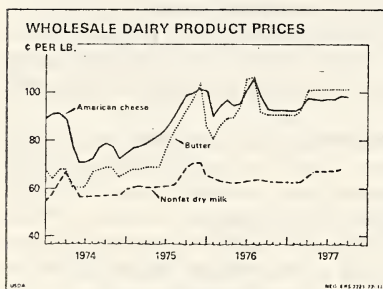


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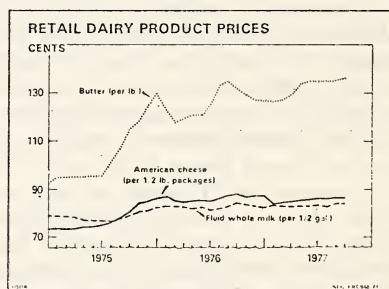


Figure 6

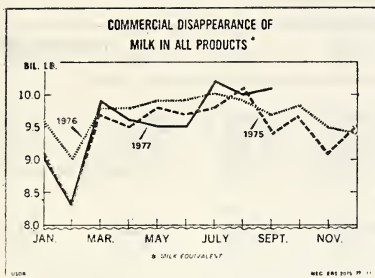


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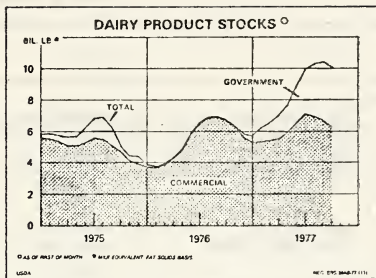


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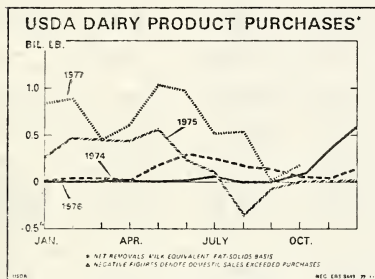


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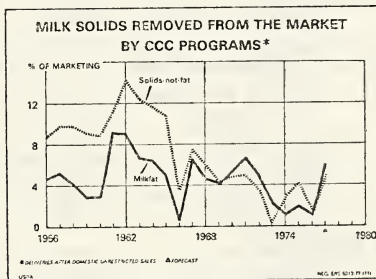


Figure 10

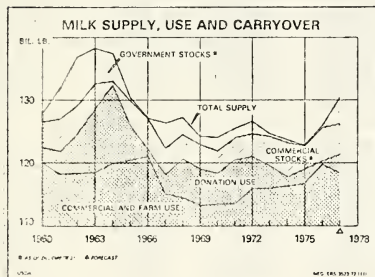


Figure 11

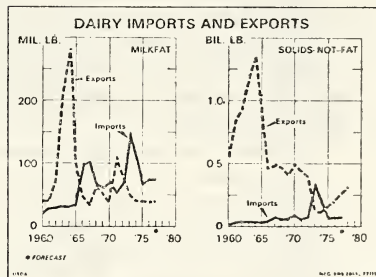


Figure 12

TABLE 1.—DAIRY SUMMARY, 1975-77

| Item | Unit | 1975 | 1976 | 1977 | Percent change, 1976-77 |
|--|------------------------------------|---------|---------|---------|----------------------------|
| Annual:¹ | | | | | |
| Milk production | Billion pounds .. | 115.3 | 120.4 | 123.3 | +2.4 |
| Milk per cow | Pound | 10,352 | 10,893 | 11,225 | +3.0 |
| Number of cows | Thousands | 11,140 | 11,049 | 10,985 | -.6 |
| Milk prices received by farmers .. | Dollars per hundred- weight. | 8.75 | 9.66 | 9.70 | +4.4 |
| Manufacturing grade | do. | 7.71 | 8.57 | 8.70 | +1.5 |
| Cash receipts | Million dollars .. | 9,909 | 11,426 | 11,800 | +3.3 |
| Value of dairy rations | Dollars per hundred- weight. | 6.25 | 6.30 | 6.00 | -4.8 |
| Milk-feed price ratio | Pound | 1.40 | 1.53 | 1.62 | +5.9 |
| Utility cow prices, Omaha | Dollars per hundred- weight. | 21.09 | 25.31 | 25.50 | +8.8 |
| January to October: | | | | | |
| Wholesale prices: | | | | | |
| Butter (Chicago, Grade A) | Cents per pound. | 75.2 | 92.3 | 97.9 | +6.1 |
| American cheese (Wisconsin assembling points, 40-lb. blocks) | do. | 83.8 | 97.0 | 96.3 | -.7 |
| Nonfat dry milk (manufac- turers' average) ² | do. | 61.1 | 63.7 | 65.8 | +3.3 |
| Dairy products (BLS) ² | 1967=100 | 151.6 | 168.4 | 172.2 | +2.3 |
| USDA net removals: | | | | | |
| Butter | Million pounds .. | 63.4 | 5.2 | 216.9 | (⁴) |
| American cheese | do. | 68.2 | 11.3 | 147.7 | (⁴) |
| Nonfat dry milk | do. | 402.6 | 120.1 | 421.9 | +251.3 |
| Evaporated milk | do. | 21.7 | 18.9 | 13.4 | -29.1 |
| Milk equivalent | do. | 2,030 | 261 | 5,979 | (⁴) |
| January to September: | | | | | |
| Retail prices (BLS): | | | | | |
| All foods | 1967=100 | 174.0 | 180.6 | 191.1 | +5.8 |
| Dairy products | 1967=100 | 154.7 | 168.4 | 173.0 | +2.7 |
| Manufactured products output: | | | | | |
| Butter | Million pounds .. | 767.8 | 730.5 | 837.6 | +14.7 |
| American cheese | do. | 1,284.2 | 1,595.3 | 1,596.7 | +1.1 |
| Other cheese | do. | 856.2 | 947.6 | 969.4 | +2.3 |
| Nonfat dry milk | do. | 833.9 | 742.1 | 890.3 | +20.0 |
| Canned milk | do. | 716.2 | 727.5 | 650.3 | -10.6 |
| Cottage cheese | do. | 664.1 | 673.9 | 677.8 | +6.6 |
| Ice cream | Million gallons .. | 655.4 | 646.1 | 634.4 | -1.8 |
| Ice milk | do. | 243.8 | 233.4 | 240.8 | +3.2 |
| Imports of dairy products: Total milk equivalent. | Million pounds .. | 948 | 1,217 | 1,282 | +5.3 |
| Commercial disappearance: | | | | | |
| Total milk | Million pounds .. | 85,350 | 87,582 | 86,178 | -1.6 |
| Butter | do. | 717.7 | 672.2 | 604.5 | -10.1 |
| American cheese | do. | 1,284.0 | 1,436.5 | 1,419.9 | -1.2 |
| Other cheese | do. | 965.2 | 1,064.2 | 1,089.8 | +2.4 |
| Canned milk | do. | 679.0 | 633.9 | 561.4 | -11.4 |
| Nonfat dry milk | do. | 519.2 | 575.0 | 501.9 | -12.7 |
| Cottage cheese | do. | 664.1 | 673.9 | 677.8 | +6.6 |
| Ice cream | Million gallons .. | 655.4 | 646.1 | 634.4 | -1.8 |
| Ice milk | do. | 243.8 | 233.4 | 240.8 | +3.2 |
| Average daily sales in urban markets:³ | | | | | |
| Fluid whole milk | do. | | | | -3.2 |
| Fluid low-fat milk | do. | | | | +6.5 |
| Cream and cream mixtures | do. | | | | -3.6 |
| Total fluid products | do. | | | | +1.1 |

¹ 1977 estimated.² January to September.³ January to August.⁴ More than 1,000.

OUTLOOK FOR POULTRY AND EGGS

(By William E. Cathcart, Agricultural Economist, Economic Research Service,
USDA)

Prospects for the egg, broiler, and turkey industries in 1978 point to increased production and lower market prices. However, with feed prices lower than a year earlier broiler and turkey producers may show a small profit during much of the year. On the other hand, egg producers may be in a cost-price squeeze by next spring.

Before discussing the outlook for poultry and eggs in more detail I would like to briefly look at the outlook for feed prices, the general economy, and red meats. My remarks concerning these topics have been fully covered by others in this conference.

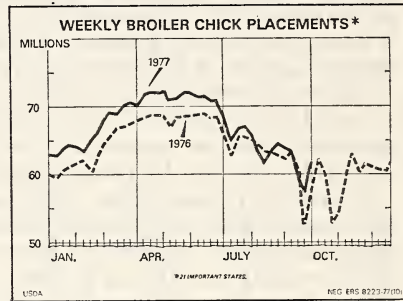
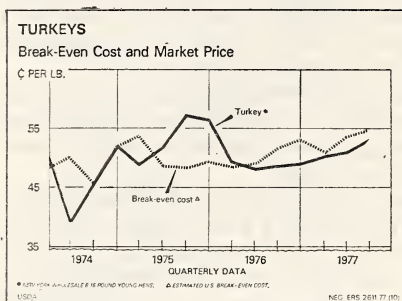
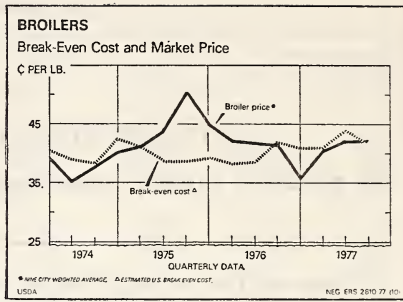
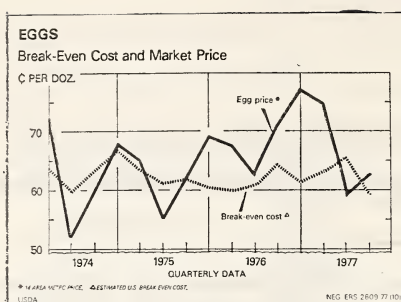
Production costs, after rising sharply last spring, declined during the summer and are currently running below a year earlier. Soybean meal prices (49-50 percent protein, Decatur) rose sharply in early 1977, peaking in April at \$299 a ton, up \$163 a ton from a year earlier. Prices have since dropped sharply and were running around \$160 a ton in late October. Feed ingredient prices likely will remain below year-earlier levels in coming months because of the large grain and soybean crops being harvested in 1977.

This year's corn crop was estimated at a record 6.3 billion bushels on October 1. Combined with an 876 million bushel carryover of old corn, this would mean a total supply for the October-September 1977-78 year of about 7.2 billion bushels, 9 percent more than in 1976-77 and a little above the previous record supply in 1972-73. Because of the large supplies relative to expected usage, prices of corn likely will range around the loan levels.

Oilseed meal supplies will also be larger in 1978. The 1977 soybean crop on October 1 was estimated at 1.6 billion bushels, 30 percent above the 1976 crop. Although carryover soybean stocks were down from a year ago, total supplies for the 1977-78 marketing season may be 16 percent above a year earlier. This would mean substantially larger soybean meal supplies for 1978 with prices averaging well below 1977.

Consequently, production costs for eggs, broilers, and turkeys likely will remain lower than a year earlier at least through the first half of 1978. Feed costs during January-June 1977 accounted for about two-thirds of the total cost of producing eggs and more than 70 percent of the cost of producing broilers and turkeys. The lower cost of feed ingredients should more than offset the rise in the cost of other production items.

Expected growth in the general economy and continued uptrend in consumers' incomes will help bolster the demand for poultry meat and eggs in 1978. Also, gains in total employment combined with some



easing in unemployment will be a plus factor for the poultry and egg industries.

Poultry producers in 1978 will face stronger competition from larger supplies of red meats. The mix will also be different. Beef supplies are likely to be below 1977 levels with larger fed beef output being more than offset by reduced nonfed beef production. Pork supplies are expected to be well above 1977, especially during the second half of 1978.

THE OUTLOOK FOR BROILERS

Broiler meat production in 1978 is expected to continue to expand. Larger supplies of competing meat and broilers will result in 1978 wholesale broiler prices averaging moderately below 1977 levels.

Broiler meat supplies in 1977 are large despite high production costs and poor profitability during much of the first half of 1977. Supplies for all of 1977 will be up around 3 percent from 1976 and 15 percent above 1975. Supplies would have been larger had it not been for the losses sustained from the extreme cold last winter and the abnormally hot weather in late spring and early summer.

Output of broiler meat in federally inspected slaughter plants this year through September exceeded a year ago by about 3 percent. Last summer's hot weather reduced the number of chicks placed for October's marketings to near year-earlier levels. However, as the weather moderated and feed prices declined, producers stepped up placements for late 1977 marketings. Chick placements suggest that there will be about a tenth more broilers than a year ago moving to market during

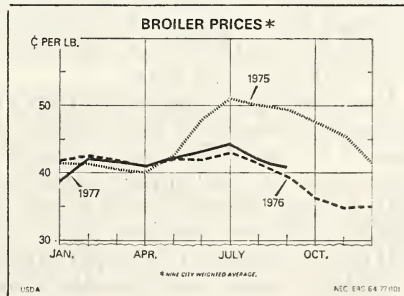
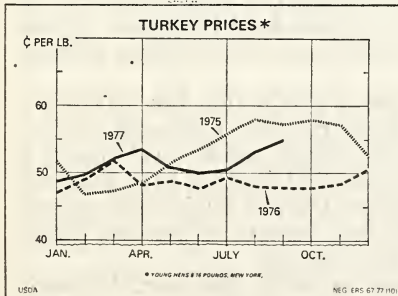
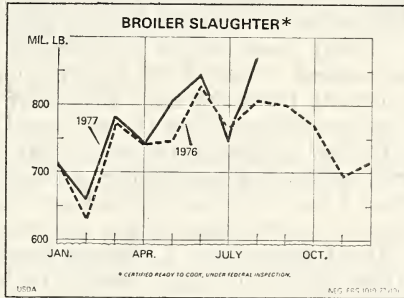
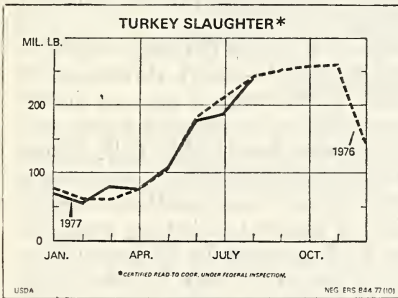
the last 6 weeks of 1977. This corresponds with the weakest demand period of the year for broilers and likely will result in broiler prices dropping below the cost of production and marketing.

The large grain and soybean crops being harvested this fall, coupled with a relatively favorable profit situation in the summer and early fall, are expected to result in broiler producers holding production above a year earlier during the first half of 1978—perhaps by 5 to 7 percent. If feed price prospects continue favorable, producers will likely continue to hold production above a year earlier during the second half of 1978. However, the percentage increase may moderate from first half levels as producers adjust to sharply larger pork supplies.

Despite large supplies of red meats and broilers this year, broiler prices exceeded year-earlier levels during much of the year. Wholesale prices in 9 cities through September averaged 41.9 cents a pound, slightly above a year earlier. Wholesale prices during October remained fairly strong, but prices will decline more than usual in November and December because of the sharp increase in marketings. Prices in late November and December may drop to the mid-30's of a year earlier despite higher than year-earlier competing meat prices.

Broiler prices in 1978 will be bolstered by increased consumer incomes and lower beef supplies. However, larger broiler and pork supplies will be more than offsetting, and broiler prices are expected to average moderately below 1977.

If broiler output during January–June 1978 increases 5 to 7 percent from 1977 levels as now seems likely, broiler prices could average in the upper 30's, compared with 41.6 cents a pound during January–



June 1978. However, the decline in broiler prices from a year earlier could be more than offset by lower production costs if feed ingredient prices turn out about as expected.

The demand for broilers has been strong in 1977. Per capita consumption of young chicken (primarily broilers) in 1977 likely will gain around a pound over the 40.4 pounds in 1976. If broiler output increases as expected in 1978, consumption of young chicken will likely increase 1 to 2 pounds from 1977 levels.

Exports of young chicken in 1977 may also exceed the record 287 million pounds of 1976. Through September this year, exports of whole young chickens and cut-up chicken parts totaled 235 million pounds, 20 percent above a year earlier. Exports were relatively large during the last half of 1976 because of the substantial shipments to Iraq. Exports to Iraq during the rest of 1977 likely will be down sharply. Even so, exports for all of 1977 likely will be a new record.

THE OUTLOOK FOR TURKEYS

Turkey production is expected to show a moderate increase in 1978, spurred by lower production costs and good profits in the fall of 1977. Larger production of competing meats and turkey will likely result in a moderate decline in turkey prices in 1978.

The 1977 turkey crop was estimated by USDA's Crop Reporting Board at 138 million birds, down 1 percent from last year's record 140 million. This is in line with the reported 1 percent fewer poults hatched from September 1976 through August 1977. Heavy breeds were estimated to total 126 million, 2 percent above 1976, but light breeds dropped 26 percent to 12 million. The change in the mix toward more heavy breed and fewer light breed turkeys reflects the demand for heavier turkeys for further processing.

Turkey meat output in federally inspected plants through September totaled around 1,250 million pounds (ready-to-cook), down nearly 3 percent from the same period of 1976. There were 5 percent fewer turkeys marketed, but the average liveweight was up nearly 2 percent.

Turkey output may about match year-ago levels this fall. Poult production, for marketing during September–December, was down about 1 percent. However, a larger percentage of these poults are heavy breeds and will result in a continuation of heavy marketing weights.

As of September 1, turkey breeder flock owners in 27 producing States indicated they planned to hold 4 percent fewer breeder hens on December 1 this year than in 1976. However, strong turkey prices this fall and prospects for significantly lower feed ingredient prices for the first half of 1978 will likely cause many breeder flock owners to alter their earlier plans.

Producers are expected to step up poult production for marketing during the seasonally light period of January–June 1978—perhaps by around a tenth. However, reduced cold storage stocks on January 1 may result in total turkey supplies in the first half of 1978 showing only a small increase from a year earlier. Output during the second half of 1978 may continue above 1977, but the rate of increase likely will narrow because of sharply larger pork output.

Turkey prices have exceeded year-earlier levels this year. Through September, prices for 8–16 pound young hen turkeys at New York

averaged 51.6 cents per pound, 3 cents above a year earlier. The gap between this year's prices and 1976 prices has widened in recent months as supplies have dropped well below last year. October's prices for young hen turkeys at New York averaged 57 cents a pound, 6 cents above July and 9 cents above a year earlier. Turkey prices this fall are expected to average in the high 50's compared with 49 cents a pound during October-December 1976.

Turkey prices in the first half of 1978 will decline seasonally from this fall's level but are expected to average near the 51 cents of January-June 1977. Prices during the second half of 1978 probably will show less seasonal increase than usual and average well below this year because of sharply higher pork supplies and increased production of broilers and turkeys.

Turkey stocks, although increasing seasonally, have declined relative to a year earlier in recent months. On October 1, turkey stocks totaled 406 million pounds, 54 million below a year ago. Stocks normally peak in November and then decline through the first half of the following year. Thus, yearend stocks may be the lowest since the early 1960's.

Exports of turkey meat this year are running substantially below 1976. Through September exports of turkey totaled about 40 million pounds, down 14 percent from the comparable period of 1976. Exports were lower to nearly all countries, with the largest poundage decline to West Germany. However, there were large increases to Nigeria and Hong Kong. Exports picked up and exceeded a year earlier during July-September, but exports of turkey for all of 1977 likely will not match the 65 million pounds of 1976.

Consumption of turkey meat for all of 1977 is expected to about match the 9.2 pounds per person in 1976. A drawdown in cold storage holdings is expected to offset lower production.

THE OUTLOOK FOR EGGS

Egg production is expanding in late 1977 and is expected to continue to increase in 1978. Egg prices in 1978 will come under pressure from increased supplies and will likely average moderately below 1977 levels.

Egg production in 1977 has been well below earlier expectations because of the unusual weather and heavy culling of old layers in the first half of 1977. Through September of this year, egg production totaled 4,001 million dozens, down a little more than 1 percent from the same months of 1976. Early in the year cold weather caused output to drop sharply below year-earlier levels. Output bounced back in April-May but the unusually hot summer again reduced output.

Also contributing to lower than expected production was the heavy cull of old layers in the first half of the year, apparently brought on the surge in feed prices and uncertainty about 1977 crops.

Egg output has picked up since the weather moderated and moved above a year ago in September. Layer numbers and the rate of lay are gaining on a year earlier and should continue to inch upward in coming months. Layer numbers on October 1 totaled 280.3 million, up nearly 2 percent from a year earlier, while the rate of lay was about

the same as a year ago. The hatch of egg-type chicks last spring suggests that 6-7 percent more replacement pullets than a year earlier will be available to enter the laying flock during October-December. Thus, laying flock numbers on January 1 likely will be 2-3 percent above January 1, 1977, and output per layer may surpass a year earlier. The laying flock is relatively young because of heavy culling during much of this year.

Layer numbers are expected to stay above a year earlier during most of 1978, even though the hatch of egg type chicks in recent months has slipped below year earlier levels. Chicks hatched during July-September were down 2 percent, and eggs in incubators on October 1 were down 6 percent from October 1, 1976. However, remember that the severe winter in 1977 caused increased mortality in both laying flocks and replacement pullets. Thus, lower mortality in early 1978 may result in more replacement pullets entering the laying flock in early 1978 than a year earlier. Also the cull of old layers probably will not be as great as during the first half of 1977.

Layer numbers during the second half of 1978 will largely depend on profitability during the winter and spring. If producers hold layer numbers 2 to 3 percent above a year earlier, egg prices likely would drop below the cost of production and marketing in early 1978. Producers could respond by stepping up culling of old layers and reducing the number of layers being force molted. This would result in layer numbers declining relative to the previous year in the second half of 1978.

Domestic shell egg prices this year have been relatively weak since early in the year despite slightly smaller total egg production, increased use by commercial breakers and hatcheries, and large exports, shell egg prices fell below a year earlier in April and have remained lower.

Through September, prices of Grade A cartoned large eggs delivered to retailers in New York averaged nearly 65 cents a dozen, 3 cents below January-September 1976. Prices were well above a year earlier in early 1977 but dropped sharply below in the spring. Prices fluctuated during the summer—ranging from the mid-50's to the mid-60's. Prices slipped further in early October to 52 cents a dozen before strengthening to 62 cents by late October. Egg prices may remain strong this fall as demand increases seasonally for the Thanksgiving and Christmas holiday seasons. However, the usual seasonal price increases will be limited by the expected increase in output. New York cartoned egg prices during the balance of 1977 likely will average 10 to 20 cents a dozen below the 81 cents a dozen for November-December 1976.

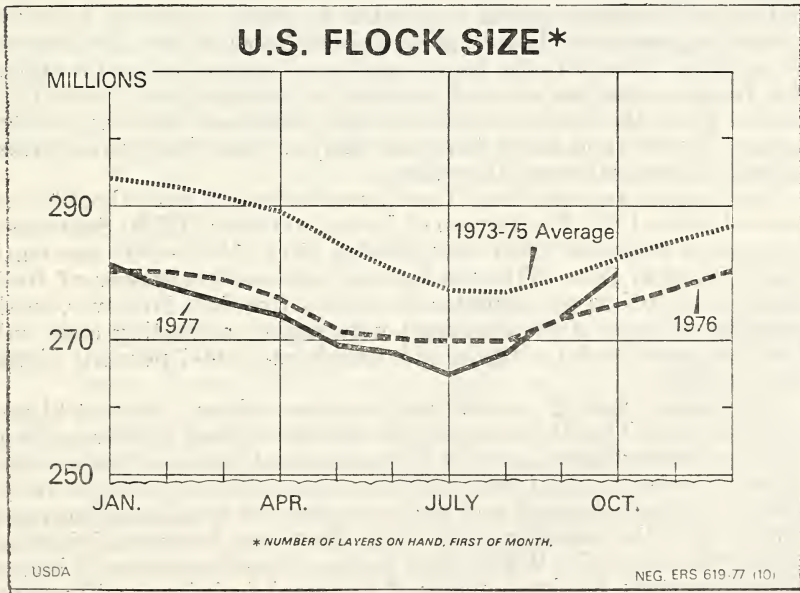
If egg production in the first half of 1978 runs 2 to 3 percent above 1977 levels, as now seems probable, egg prices will continue below a year earlier. New York prices may average around 60 cents a dozen in the winter before dropping to the low 50's in the spring. This would compare with 75 cents and 58 cents in the first and second quarters of 1977. A continued expansion in egg output could result in egg prices in the second half of 1978 averaging in the mid-to-high 50's. This means that market prices for eggs likely would not cover the costs of production and marketing.

U.S. imports and exports are up sharply this year. Imports of shell eggs and egg products from January to September totaled 15 million dozens (shell equivalent)—up 13 million from the very low levels of 1976. Most imports were shell eggs from Israel, Canada, and Mexico. Imports normally account for less than one-half of 1 percent of our total egg supplies. Although egg imports were up sharply, they were more than offset by gains in exports. Exports of shell eggs and egg products during January–August increased almost 20 million dozen to 46 million dozen, shell equivalent. Most of the increased exports this year were to Hong Kong and Venezuela. Exports in recent years have amounted to less than 1 percent of total egg supplies.

Shipments of shell eggs and egg products to American territories through September totaled 20 million dozens (shell equivalent) down from 22.4 million a year earlier. Shell egg shipments were down almost 25 percent to 15.6 million dozens, while egg products gained 81 percent to 4 million pounds.

A bright spot in the egg industry this year has been the sharp increase in shell eggs going to breakers. Commercial egg breakers through September had broken 19 percent more eggs than the 440 million dozen in the same months of 1976. Weekly reports indicate that breakings continued to run above last year through October.

With the rise in egg breakings, stocks of frozen egg products moved above the very low levels of a year ago during July but are still well below other recent years. Cold storage holdings of frozen egg products totaled 34 million pounds on October 1, up 17 percent from a year ago but still a third below 2 years earlier.



OUTLOOK FOR FRUIT AND TREE NUTS

(By Jules V. Powell, Agricultural Economist, Economic Research Service, USDA)

GENERAL PRICE PROSPECTS

The 1977-78 season will be a banner year for most producers of fruits and tree nuts. Smaller supplies of most citrus crops, ample supplies of most noncitrus, and strong consumer demand are expected to keep prices for fresh and processed fruit this season 4 to 7 percent above 1976-77.

Prices received by growers for fresh and processed fruit so far this year have averaged substantially above last year. The October index of prices received by growers stood at 221 (1967=100), up sharply from September's level. Higher prices were recorded for all fruits except strawberries. The seasonal increase in supplies of fresh fruit this fall will result in price declines from current levels, but the price index in the fourth quarter is still expected to average considerably higher than a year ago. Consequently, the 1977 index of prices received by growers for fresh and processed fruit will average higher than in 1976.

The 1977 contract prices negotiated for most noncitrus fruit for processing are above those in 1976. This will push up the 1977 grower price index. Even with the larger apple crop, grower prices for apples for fresh market use are not expected to decline from 1976's high levels. Thus, the higher contract prices combined with the smaller output of pears and citrus fruit are likely to push the growers prices above 1976 levels through the winter.

Retail prices for most fresh fruit have also ranged from about 5 to 15 percent above 1976. The Bureau of Labor Statistics (BLS) September retail price index for fresh fruit stood at 180.4 (1967=100), one-tenth higher than in 1976. With the seasonal increase in supplies of fresh fruit, retail prices are expected to decline this fall. However, small supplies of citrus fruit combined with higher marketing costs will keep the retail fresh fruit price index moderately (4-7 percent) higher than in 1976.

Wholesale prices of canned fruit have been about 5 percent higher than last year. The BLS wholesale price index dipped in July and August, but strengthened again in September and October. The October index advanced to 181 (1967=100), 4 percent above a year ago. In response to good demand and tight supplies of frozen concentrated orange juice, the wholesome price index for frozen fruits and juices has been well above 1976. With higher prices of raw products and higher processing costs, wholesale prices of processed fruit items will remain higher through the winter.

TABLE 1.—INDEX OF QUARTERLY PRICES RECEIVED BY GROWERS FOR FRESH AND PROCESSED FRUIT
[1967=100]

| Year | 1st | 2d | 3d | 4th |
|-----------|-----|-----|-----|-------|
| 1973----- | 123 | 136 | 148 | 142 |
| 1974----- | 133 | 140 | 148 | 142 |
| 1975----- | 129 | 152 | 140 | 130 |
| 1976----- | 130 | 134 | 127 | 137 |
| 1977----- | 124 | 154 | 165 | ----- |

Source: Agricultural prices, SRS.

TABLE 2.—QUARTERLY RETAIL PRICE INDEXES FOR FRESH FRUITS
[1967=100]

| Year | 1st | 2d | 3d | 4th |
|-----------|-----|-----|-----|-------|
| 1973----- | 126 | 142 | 148 | 139 |
| 1974----- | 138 | 153 | 164 | 149 |
| 1975----- | 150 | 171 | 177 | 147 |
| 1976----- | 146 | 161 | 170 | 147 |
| 1977----- | 172 | 190 | 193 | ----- |

Source: Retail price, BLS.

FRESH CITRUS FRUIT

The first forecast of U.S. citrus production (except grapefruit in California, other than desert areas) for the 1977-78 season is estimated at nearly 14.3 million tons, down 6 percent from 1976-77 and 2 percent below 1975-76. Orange production is forecast to be 9 percent smaller than last year, but larger crops are indicated for Florida grapefruit, tangerines, and Temples. Tangelos are estimated to be the same as 1976.

The smaller orange output is mostly due to a drastic reduction in the early and midseason Florida orange crops, down 23 percent from last year's record crop and the smallest crop since 1971-72. The set of fruit on trees is the prime contributor to the production decline as a result of last year's freeze. In addition, orange acreage is down somewhat in Florida.

Price behavior for oranges during the 1977-78 season will depend on a number of factors. Acting to push the price up will be sharply lower carryover stocks of frozen concentrated orange juice. Increased consumer disposable income and higher prices for most competing fruits also will strengthen prices. In addition, export shipments of U.S. oranges during 1977-78 could reach the 1976-77 level. Trade reports indicate smaller orange supplies from the Mediterranean region, especially Spain. Smaller supplies of competing fresh noncitrus fruit, especially apples, in Europe will also probably strengthen demand for oranges. Despite the smaller domestic crop, strong demand, and higher prices, the recent depreciation of the dollar relative to other currencies may make U.S. oranges a good buy to foreign buyers if current relationships are maintained. Consequently, current prospects for oranges through the winter months point to grower prices declining seasonally, but averaging moderately above year-earlier levels. These prices will show up at the retail level.

Supplies of grapefruit for 1977-78 are expected to total 3 million tons or 73 million boxes (for California, includes Desert Valley fruit only), up 2 percent from last season. The large crop this season results from a record Florida crop. Florida's grapefruit crop is forecast at an all-time high of 54 million boxes, 5 percent above the previous record set last season. Arizona growers also expect to harvest a 3-percent larger crop, but the crop in Texas will be down 7 percent and the California Desert Valley crop will be 2 percent less than last season.

Carryover stocks of most grapefruit products are up going into the 1977-78 season. Both chilled and frozen concentrated grapefruit juices have shown good growth patterns in recent years. Processor demand for the new crop could be good.

Domestic movement of fresh grapefruit during 1977-78 is expected to expand and exports should also register a gain over 1976-77. The export market is of vital importance to domestic producers. In view of the record crop in prospect, prices for grapefruit are expected to decline moderately from last year. However, improved export prospects this season might curtail downward price pressure.

The Arizona-California lemon crop is forecast at 25.3 million boxes, 1 percent less than last year, but 44 percent greater than the 1975-76 crop. In mid-October harvest was well underway in both States and quality was good. Arizona's crop, at 5.3 million boxes, is up slightly over last year, while California's crop, at 20 million boxes, will be down 3 percent.

Total movement from August 1 through October 22 was moderately smaller than a year ago. Shipments to processors and export markets, so far this season, are down 20 and 12 percent, respectively, from a year earlier, but deliveries to the fresh market have been running ahead of a year ago. Reflecting a slightly smaller crop with a smaller proportion of large lemons than usual, f.o.b. prices for fresh lemons so far this crop year have averaged 17 percent higher than last year. Prices during 1977-78 season are expected to average moderately higher than during the previous season as both domestic and export markets for fresh lemons appear to be strong.

PROCESSED CITRUS FRUIT

With the record large 1976-77 citrus crop, utilization for processing reached another record of 11.5 million tons, 8 percent above the record set in 1975-76. Processing accounted for three-fourths of total utilized production, also a new record. More than four-fifths of the oranges, 62 percent of the grapefruit, and 49 percent of the lemons were processed.

Florida's 1976-77 pack of FCOJ amounted to 158 million gallons, substantially below 1975-76. This small pack was caused by the severe January freeze which seriously reduced the juice yield of oranges. Processors recovered only 1.07 gallons of 45° brix FCOJ per box from the 1976-77 crop, compared with 1.29 gallons in 1975-76 and 1.31 gallons in 1974-75. Juice yield is estimated to be 1.28 gallons per box for the 1977-78 crop.

Despite higher prices, movement of FCOJ has been very good. In anticipation of a record large 1976-77 crop, f.o.b. (unadvertised brands) had been as low as \$1.60 per dozen 6-ounce cans last year. Immediately following the freeze most canners withdrew from the market. Major packers reentered the market with prices ranging from \$2.20 to \$2.40 per dozen 6-ounce cans, and on February 8 a major packer increased the price to \$2.60 per dozen. Early November the f.o.b. price jumped to \$3.25 per dozen 6-ounce cans (unadvertised brands).

Despite this price escalation, movement of Florida FCOJ through October 22 had amounted to 188 million gallons, slightly above the rate of a year earlier. Consequently, packers' stocks on October 22 stood at 42.8 million gallons, which was substantially less than the industry would like to have. If movement continues at the current pace of 3.0-3.5 million gallons per week (retail, institutional, and bulk), carryover stocks at the end of the season could be as low as 25 million gallons. This prospect, plus the prospect of a smaller 1977-78 crop with juice yields of 1.28 gallons per box, will keep supplies at moderate levels and prices well above year-earlier levels.

FRESH NONCITRUS

The 1977 noncitrus fruit crop is forecast at 11.14 million tons, slightly below last year's level and 4 percent below 1975. However, cold storage holdings of fresh noncitrus fruit at the beginning of October were considerably larger than in 1976. Shipping point prices for most fresh noncitrus fruit are generally above a year ago. With the prospective good demand from processors, prices received by fruit growers are expected to average higher than in the 1976-77 season.

The October 1 forecast of the 1977 U.S. apple crop is 6.9 billion pounds. This is 8 percent above last year's freeze-damaged crop, but 8 percent below the record 1975 total.

Because of the late harvest, shipments of fresh apples are running moderately behind last year's pace. Even with a larger crop, available supplies of apples for fresh market are not likely to be substantially

TABLE 3.—U.S. NONCITRUS FRUIT: TOTAL PRODUCTION, 1975, 1976, AND INDICATED 1977

[In thousand tons]

| Crop | 1975 | 1976 | 1977 |
|-----------------------|---------|---------|---------|
| Apples..... | 3, 748 | 3, 198 | 3, 440 |
| Apricots..... | 183 | 155 | 145 |
| Cherries, sweet..... | 152 | 173 | 147 |
| Cherries, tart..... | 145 | 73 | 107 |
| Cranberries..... | 104 | 120 | 108 |
| Grapes..... | 4, 379 | 4, 304 | 4, 196 |
| Nectarines..... | 111 | 133 | 130 |
| Peaches..... | 1, 421 | 1, 509 | 1, 446 |
| Pears..... | 748 | 847 | 755 |
| Prunes and plums..... | 650 | 630 | 661 |
| Total..... | 11, 641 | 11, 142 | 11, 136 |

Source: Crop production, SRS.

larger. Processor demand is expected to remain strong during the 1977-78 processing season as processor inventories of canned apples and applesauce are small.

Opening f.o.b. prices for fresh apples were generally mixed at major shipping points. Prices generally have been slightly to moderately below a year ago, but good processor demand combined with a smaller prospective citrus crop could dampen the downward pressure on prices. In addition, foreign demand for our fresh apples looks favorable. Apple production in Western Europe for 1977 is expected to be nearly one-fifth below the previous season which was considered as normal. Output in the two key exporting countries, France and Italy, is down 24 percent and 16 percent, respectively, from a year ago. Production in West Germany, a key importing country on the Continent, is down 23 percent from last year. Export prospects to Canada, an important customer, may be off somewhat as the Canadian apple crop is expected to be up moderately from the 1976 level.

This season's U.S. grape production is forecast at 4.2 million tons, 3 percent under the 1976 total. In California, production is expected to total 3.9 million tons, only slightly ahead of a year ago. Larger crops of wine and table varieties more than offset smaller output of raisin varieties.

Total grape production from States other than California and Arizona is now estimated at 283,720 tons, down 30 percent from 1976. New York, the second largest producing State, estimated a crop of 98,000 tons, approximately half of last year's quantity. Substantial decreases from last year in grape production are also recorded for Ohio and Pennsylvania.

Because of the late season, shipments of fresh grapes totaled 14,144 carlots through mid-October compared with 17,198 during the same period last season. Consequently, shipping point prices for California grapes have been substantially above last year. In Kern County, Calif., Ribier was quoted at \$8 per 23-pound lug in mid-October, compared with \$6.25 a year ago. More Thompson Seedless grapes are expected to be dried for raisins. There is virtually no carryover of raisins from last year when the unusual September rain destroyed much of the raisin crop. Fresh grape prices could remain moderately to substantially above last year because of strong demand from raisin packers and wineries.

Smaller available supplies of Bartlett pears have resulted in higher prices for both fresh market processing use. Growers and canners in California agreed to a field price of \$120 per ton for No. 1 grade Bartletts compared with \$105 in 1976. The Washington-Oregon Canning Pear Association reported the cannery price for No. 1 Bartletts, 2 inches and larger, at \$115 per ton, up 6 percent from a year earlier. Prices for fresh pears are expected to remain firm as the foreign market situation is also favorable. The 1977 pear crops in major producing countries such as France, Germany, and Italy are expected to be sharply below last year's large crops. In addition, the expected sub-

stantial decline in winter pear production in the Northwest will also strengthen the late-season market.

PROCESSED NONCITRUS

Despite the slightly smaller noncitrus crop, the 1977-78 pack of most noncitrus fruit is likely to be above that of a year ago. However, total supplies of canned noncitrus are still expected to be near last year's level because of smaller carry-in stocks at the beginning of the season. Dried fruit supplies will be larger. Supplies of frozen fruit could be moderately above a year ago. However, with higher costs of raw materials and processing, prices of most processed noncitrus items at all levels are expected to remain firm.

The 1977-78 pack of most canned noncitrus fruit will probably be larger than last year. The total pack of clingstone peaches amounted to 27.6 million cases (24 No. 2½'s) compared with 22.8 million cases last year. Total pack of canned tart cherries is up 38 percent from 1976, while that of canned sweet cherries is near last year's level. The canned apricots pack amounted to 2.3 million cases (24 No. 2½'s), down moderately from last year. However, with the larger apple crop in major processing areas and smaller carryover stocks of canned apples and applesauce, the total pack of canned apple products will be above a year ago. The Bartlett pear pack will be smaller.

In response to smaller supplies, wholesale prices of canned fruit during the first 10 months of 1977 have averaged moderately higher than a year ago. Likewise, retail prices of canned noncitrus fruit are also slightly to moderately higher. In view of higher costs of raw materials, processing and marketing, prices of most canned fruits at all levels are likely to remain higher.

Exports of canned noncitrus fruit so far this season have shown a mixed pattern. Exports increased sharply from a year ago for canned peaches, pears, and fruit cocktail and dropped for apricots, pineapples and cherries. A smaller noncitrus crop in Western Europe is likely to enhance our exports, although the economic slowdown could be a moderating factor.

U.S. dried fruit production for the 1977-78 season is expected to total above a year earlier when rains severely damaged the raisin variety grapes. Production of dried prunes, another major dried fruit item, is currently estimated at 152,000 tons, moderately larger than last year.

Wholesale prices of dried prunes and raisins have been considerably above year-earlier levels. The BLS October wholesale price for dried prunes was \$11.29 (16-ounce package, case of 24) compared with \$9.91 a year ago. The wholesale price of raisins in October at \$16.05 (15-ounce package, case of 24), dropped one-fifth from September but was still slightly above last year's net price. Prices for raisins are expected to average lower this season in view of the larger supplies.

The U.S. pack of frozen deciduous fruits and berries is expected to surpass the 1976 pack of 587 million pounds. Through October 1, receipts of domestic strawberries by California freezers totaled 176 mil-

lion pounds, sharply more than 140 million pounds a year earlier. During the first 8 months of 1977, imports of frozen strawberries amounted to 39,700 metric tons, more than double last year's small imports. Imports from Mexico are expected to remain above 1976 for the balance of the year as total production of strawberries during 1976-77 returns to more normal levels. Furthermore, for the 1977-78 strawberry season, the area planted to strawberries in Mexico is expected to reach 5,200 hectares, an increase of 11 percent from 1976-77.

Cold storage holdings of frozen fruits and berries (excluding juices) on October 1 totaled 627 million pounds, one-fifth larger than a year earlier. Despite a substantial increase in frozen stocks, the BLS wholesale price of frozen strawberries has been steady at \$4.94 per dozen 10-ounce packages since July. Because of larger supplies, current indications point to declining prices during 1977-78.

TREE NUTS

The total crops of the four major domestic tree nuts (almonds, filberts, pecans, and walnuts) are estimated to be 603,500 tons (in-shell basis), substantially larger than last season. A pecan crop sharply larger than the very small crop last year, plus large crops of almonds and walnuts are responsible. Prices for almonds and walnuts are higher than last year. Prices for pecans will probably decline from high opening levels.

PER CAPITA FRUIT CONSUMPTION

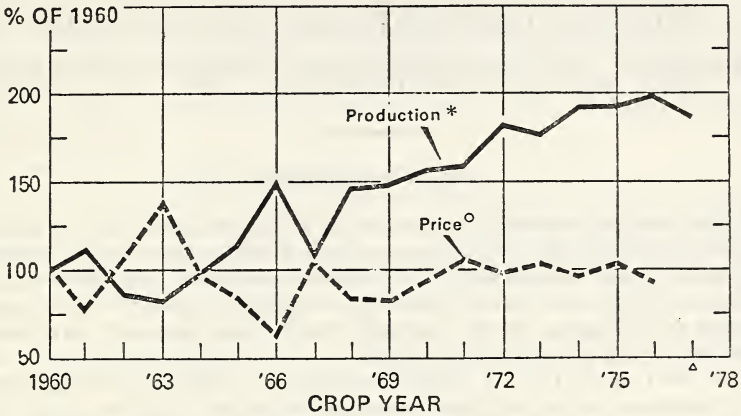
Civilian per capita fruit consumption in 1976 reached 221.4 pounds (fresh weight equivalent), the highest level since 1946. This level was 7.8 pounds, or nearly 4 percent above 1975. The increases were shared by both citrus and noncitrus fruit.

The per capita consumption of all fresh fruit increased from 83.7 to 86 pounds between 1975 and 1976 due entirely to the increase in non-citrus consumption. Consumption of fresh noncitrus fruit increased 3 percent because of increased consumption of apples and bananas. The consumption of bananas rose to 19.5 pounds per person, and that of apples—the second most popular fruit—rose to 18.7 pounds. Per capita consumption of fresh citrus decreased 0.6 pound to 29.2 pounds in 1976.

Per capita consumption of processed fruit increased from 129.8 in 1975 to 135.7 pounds in 1976, due mostly to increases in the consumption of frozen and chilled citrus juices.

However, preliminary data indicate that per capita consumption of fresh fruit will decline to 82.6 pounds per person in 1977 due mostly to the reduced fresh apple and orange supplies available during 1977. Consumption of fresh apples is expected to dip to 17.9 pounds per person for 1977 and fresh citrus consumption will probably be about 26.5 pounds per person. Data are not available on the per capita consumption of processed fruit items.

CITRUS FRUIT PRODUCTION AND PRICES

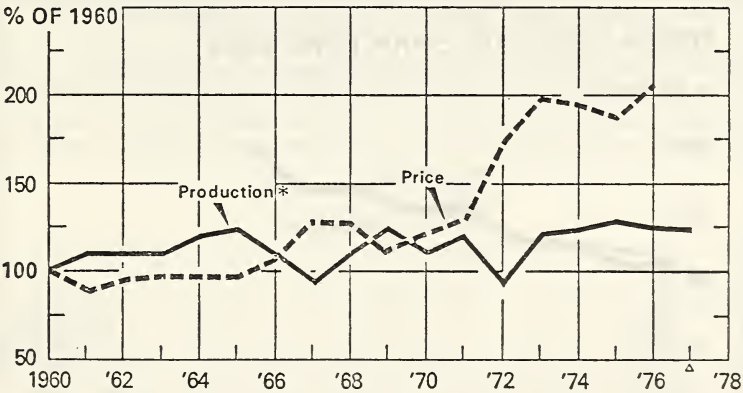


* INCLUDES PRODUCTION OF ALL CITRUS FRUITS. ° SEASON AVERAGE PRICE TO GROWERS.
PRICE WEIGHTED BY PRODUCTION. Δ PRELIMINARY.

USDA

NEG. ERS 2042-77(4)

NONCITRUS FRUIT PRODUCTION AND PRICES



* 15 IMPORTANT FRUITS. ° SEASON AVERAGE PRICE TO GROWERS.
PRICE WEIGHTED BY PRODUCTION. Δ PRELIMINARY.

USDA

NEG. ERS 8485-77(8)

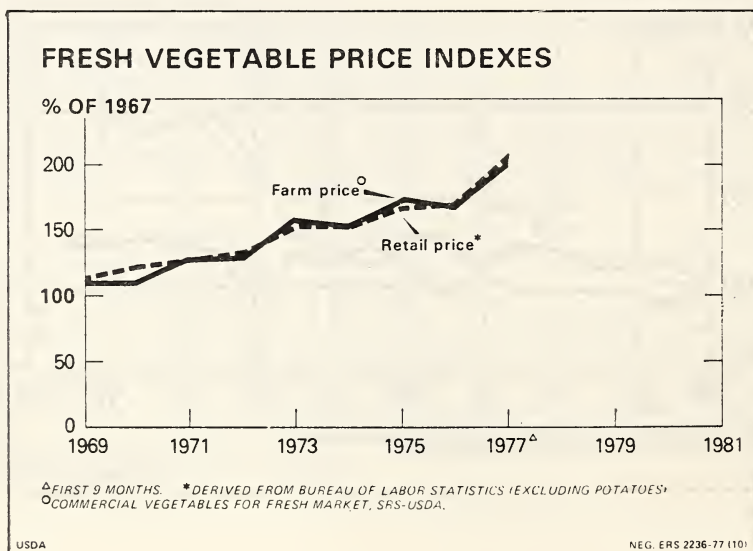
OUTLOOK FOR VEGETABLES AND POTATOES

(By Charles W. Porter, Agricultural Economist, Economic Research Service, USDA)

FRESH VEGETABLES

Fresh market vegetable prices to growers averaged sharply higher for the first half of 1977 because of the Florida freeze plus reduced shipments from Texas early in the year. Increased supplies in late spring and summer pushed prices down rapidly, and for the summer quarter of 1977, the fresh vegetable price index actually dropped a point below the same period of 1976.

For the rest of 1977, a slight seasonal price rise may be expected, with prices averaging slightly less than the fourth quarter of last year. Retail vegetable prices in 1977 followed grower price trends, though not in as volatile a pattern, rising less, but falling less somewhat later. This relationship is the usual pattern. For the third quarter, the index of retail fresh vegetable prices is 178 (1967=100), a figure 7 percent more than the comparable quarter of 1976. Fourth quarter retail prices may rise slightly, yet hold close to or a little above a year earlier.



Even though water will remain critically short in California through the fall, enough will continue to be available to bring in ample supplies of vegetables. This past summer, California vegetable producers drilled deeper wells, shifted production areas, and, in some instances, traded water with other growers in order to bring in vegetable supplies close to the market's normal needs. Also, some growers in other States planted more in anticipation of short supplies from California. As a result, supplies of many crops were adequate to generous this summer, despite the drought in the leading vegetable producing State.

Fall acreage and supply prospects

Fall fresh vegetable acreage in the United States is 5 percent larger than a year earlier, which would mean 6-percent larger tonnage if yields follow the recent historical average. These data include 14 crops but omit melons. The crops that show the greatest acreage and/or potential production gain are snap beans, broccoli, cabbage, carrots, cauliflower, cucumbers, eggplant, lettuce, peppers, tomatoes, and Florida sweet corn. Prospects are for less celery, spinach, and California sweet corn.

PROCESSED VEGETABLES

Contract acreage devoted to processing vegetable crops was 4 percent larger this year as there was a need to replenish frozen vegetable stocks, and a few canned items like beans and beets were on the light side. However, raw product tonnage from this acreage is a whopping 18 percent greater this year, despite the threat posed by drought in California, the Pacific Northwest, and parts of the upper Midwest. This suggests that many individual producers successfully managed to solve their water supply problems, and that heavy production of tomatoes and sweet corn has resulted.

Much of the gain in tonnage is coming from California tomatoes which do not directly compete with other fresh and processed vegetables. However, not all this increase for 1977 is associated with tomatoes. There are also larger crops of lima beans, snap beans, sweet corn,

FRESH VEGETABLE SUPPLIES¹

[In thousand hundredweight]

| Supply | 1976 | 1977 |
|---------------------------------|----------|----------------------|
| U.S. winter production..... | 34, 149 | 29, 680 |
| U.S. spring production..... | 58, 903 | 60, 734 |
| U.S. spring onions..... | 7, 172 | 5, 343 |
| Imports (January to June)..... | 14, 006 | 16, 639 |
| Total 6 mo. supply..... | 114, 230 | 112, 396 |
| U.S. summer production..... | 64, 341 | ² 64, 606 |
| U.S. fall production..... | 44, 237 | ² 46, 866 |
| U.S. spring onions..... | 20, 810 | 19, 706 |
| Imports (July to December)..... | 2, 961 | NA |
| Annual supply..... | 246, 579 | |
| Percent..... | | ±1 |

¹ Includes melons.

² Based on historical average yields.

NA=not available.

and beets—items which are often substituted one for the other, depending on price and availability. For example, the large pack of canned sweet corn expected this year probably will have some effect on prices of peas, snap beans, and other canned items.

The total supply (pack plus carryover) of canned vegetables for 1977-78 at this time looks to be about 2 to 4 percent larger than a year earlier and nearly equal to 2 years ago. This estimate excludes most tomato products but includes pickles and sauerkraut.

Wholesale prices for canned vegetables rose steadily between March and August. With promotional allowances and off-the-line price cuts numerous, it is now likely that prices will average either the same or barely higher than in late 1976. In contrast, wholesale prices for most frozen vegetables range at least moderately to substantially higher this fall than last. It appears that there will be fewer promotional allowances for frozen vegetables than for canned, as the supply picture shows signs of being adequate but certainly not excessive. Stocks of frozen vegetables on October 1 were 1.6 billion pounds, 1 percent less than a year earlier.

Processing vegetable acreage in 1978 is likely to be moderately smaller as less tomatoes and corn will be needed for expected market needs. These crops account for about two-thirds of all processed vegetable tonnage. Some additional acreage of snap beans could easily be accommodated, along with a moderately larger acreage to be devoted to freezing of peas.

POTATOES

The U.S. fall crop production of 303.6 million hundredweight is indicated 1 percent smaller than the record crop of 1976, and area for harvest unchanged from last year. Yields were slightly lower, 266 hundredweight versus 269 hundredweight in 1976.

In the eight Eastern States, fall production 51.6 million hundredweight is 2 percent above a year earlier although yields were below those of last year. Blight, a major problem in southern Aroostook County, forced many growers to kill vines and harvest some fields earlier than normal. In addition, wet weather during harvest caused some acreage loss and rot is evident in some fields. Heavy rains throughout September restricted harvest in New York and standing water caused some quality problems. In Pennsylvania, harvesting was also frequently interrupted because of excessive moisture.

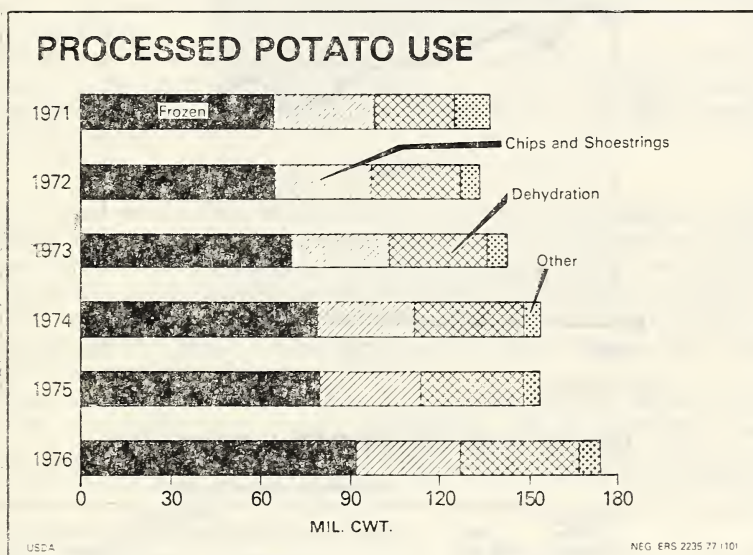
In the eight Central States, production 13 percent more than a year earlier at 64.6 million hundredweight. Yields were above those of 1976 and 21,000 more acres were harvested than a year ago. Wet weather delayed harvest in many areas of Michigan. While the Red River Valley area of Minnesota and North Dakota had some interruptions in harvesting because of rain, the quality of the crop is good.

Production in the Western States at 187.4 million hundredweight is 6 percent less than last year. Both acreage and yields were lower than last year. Quality of the crop is generally good. Rains have caused some delays in harvest in northern California.

Price and supply implications

With a fall crop only 1 percent smaller than last year's record high, grower prices in the fourth quarter will remain low and hold

close to those of a year earlier. Some gradual price improvement from the October figure of \$3.12 may develop as the storage season progresses. If so, U.S. average prices to growers would then be following last year's pattern between now and early April. The April 1977 average price was \$4.10 per hundredweight. Had it not been for blight in Maine and untimely rains in several Eastern and Midwestern districts, the crop might have turned out even larger. Markets were cleaning up summer supplies which helped the grower price situation to some extent, but with export demand reverting to the usual pattern, and processing activity only moderately strong, the market lacks the brisk pace of a year earlier. Demand for potatoes for freezing purposes is expected to be well maintained, but demand for dehydrated products is likely to continue sluggish.



Winter acreage up 1.4 percent

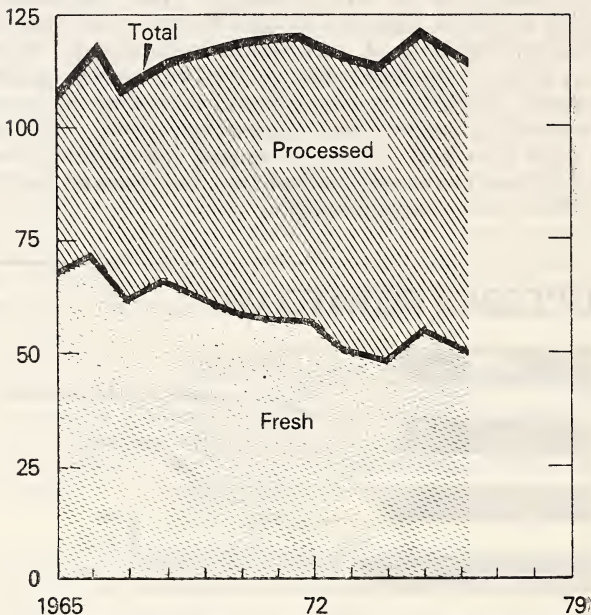
Growers in California intend to plant 11 percent less acreage for harvest in the winter quarter of 1978. On the other hand, Florida growers intend to increase their acreage for harvest by 8 percent to 9,800 acres. Overall, the intended winter quarter acreage is 1.5 percent above that for 1977. In light of the present estimate of 1977 fall crop, Florida growers may reassess their intentions.

Per capita use to recover

Total per capita potato use declined in 1976, but is expected to recover as record large stocks were carried over the current year. Per capita processed potato consumption fell slightly in calendar year 1976, the first drop in 20 years of statistical record. It was due to smaller January stocks of 1975 crop, plus record export activity in dehydrated products. Frozen products have continued making annual gains thus far in the 1970's, while chip use has eased downward slightly, though some recovery was shown in 1976.

PER CAPITA CONSUMPTION OF POTATOES

POUNDS



1977 PRELIMINARY.

PRODUCTION AND PER CAPITA CONSUMPTION OF POTATOES, 1960-76¹

| Year | Production (million hundred- weight) | Total fresh and processed | Per capita consumption (pounds) | | | | | |
|-------------------|---|---------------------------------|---------------------------------|------------------------|---------------------|--------|--------------------------|------------|
| | | | Fresh | Processed ¹ | | | | |
| | | | | Total | Canned ² | Frozen | Chips and shoestrings | Dehydrated |
| 1965 | 291.1 | 107.0 | 68.2 | 38.8 | 1.7 | 14.3 | 15.8 | 7.0 |
| 1966 | 307.2 | 116.8 | 72.4 | 44.4 | 1.7 | 17.3 | 16.7 | 8.7 |
| 1967 | 305.8 | 108.0 | 62.0 | 46.0 | 1.7 | 19.0 | 16.9 | 8.4 |
| 1968 | 295.4 | 115.2 | 65.9 | 49.3 | 1.9 | 21.2 | 17.1 | 9.1 |
| 1969 | 312.4 | 116.8 | 61.6 | 55.2 | 2.0 | 24.6 | 17.7 | 10.9 |
| 1970 | 325.8 | 117.6 | 58.4 | 59.2 | 2.0 | 27.7 | 17.7 | 11.8 |
| 1971 | 319.4 | 118.9 | 57.0 | 61.9 | 2.2 | 30.3 | 17.3 | 12.1 |
| 1972 | 296.0 | 119.2 | 57.2 | 62.0 | 2.1 | 30.6 | 17.0 | 12.3 |
| 1973 | 299.4 | 116.5 | 51.6 | 64.9 | 2.3 | 33.2 | 16.6 | 12.8 |
| 1974 | 342.1 | 114.2 | 48.3 | 65.9 | 2.3 | 33.0 | 16.1 | 14.5 |
| 1975 | 319.8 | 121.9 | 54.6 | 67.3 | 2.1 | 34.8 | 15.9 | 14.5 |
| 1976 ³ | 357.4 | 115.4 | 50.2 | 65.2 | 2.0 | 36.9 | 16.2 | 10.1 |

¹ Fresh weight bases.² Includes potatoes canned in soups, stews, and other combinations.³ Preliminary.

MUSHROOMS

U.S. mushroom production set another record in 1976-77—moving up 12 percent over a year earlier to 347 million pounds. Pennsylvania, the leading State, accounted for 199 million pounds or 57 percent

of the U.S. total. The U.S. average yield of 2.9 pounds per square foot is the highest yield attained in the years since annual data have been published.

Fresh market sales of mushrooms at 151 million pounds increased less this past season than in other recent seasons. Gains, nonetheless, were 6 percent over a year earlier and fresh use absorbed 44 percent of U.S. output. The average price received by growers reached 82 cents a pound for fresh use, the highest price of record.

For the first time in several years, domestic canned pack data are available. The International Trade Commission (ITC) recently estimated that 101.5 million pounds of brine-packed mushrooms were packed in the United States between July 1, 1976, and June 30, 1977. The data for 1975-76, when 67 million pounds were reported, are not exactly comparable, but it would appear that the latest pack probably was record large.

Further gains in mushroom use may be expected during 1977-78 as growers recently stated they intend to increase bedding space by 10 percent, and import activity is expected to be at least reasonably well maintained.

DRY EDIBLE BEANS

U.S. bean production estimates for this year declined during September. The crop is now estimated at 16.1 million hundredweight, 7 percent less than last year. Generally speaking, there are likely to be about the same supplies of white beans, but reduced supplies of colored classes. It is largely a question of a few more navy beans in Michigan, fewer great northrens from Nebraska, and smaller crops of pintos in the Rocky Mountain States.

Total supplies of white classes may not be greatly different this year as wet fields have caused substantial loss of Michigan navy beans. A few fields may not be harvested, and other fields which once had been thought to be carrying an ideal crop, turned out average or less than average yields. Untimely wet weather also reduced prospects for pinto beans in the Red River Valley.

The U.S. average grower price for all classes of beans jumped sharply between September and October moving from \$13.80 per hundredweight to \$22.20. Supplies are generally adequate to meet normal domestic needs, but if brisk export trade should develop, further price rises would be expected. Export prospects for white beans appear relatively favorable, but with Mexico expected to export substantial tonnage in 1977-78, foreign demand for U.S. grown pintos and other colored classes may not be too strong.

For 1977-78 there is the prospect of sales development in the Near East and certain Mediterranean countries. Recent attache reports note that Spain seems likely to depend more on imports of dry beans than on domestic output. This coming season, Belgium and the Netherlands are likely to be buying a good volume of white beans from the United States, although there will be some Ethiopian competition. Exportable supplies of white beans from Argentina are limited until the new crop becomes available next spring. The old crop (spring

1977) was small. The Canadian crop of pea beans which competes with Michigan in export markets is expected to be at least a third less than last year's crop. But the attache in Tokyo reports that for the year beginning October 1, import quotas will be smaller in view of increased domestic bean output and a relatively larger quantity expected to be carried over.

FAMILY LIVING

THE OUTLOOK FOR THE LABOR FORCE: IMPLICATIONS FOR FAMILIES

(By Deborah Pisetzner Klein, Office of Current Employment Analysis, Bureau
of Labor Statistics, USDL¹)

In recent years we have all heard on television and read in newspapers and magazines about the demise of the American family. Stories on rising levels of marital disruption due to divorce and separation and the prevalence of nontraditional living arrangements among young people have filled the media. These stories were clearly based on facts and reflect real changes in living arrangement for many people. However, most people continue to live in families. Among the 74 million households in the United States, there are about 56 million families. (The remaining households consist of persons who live alone or with persons to whom they are not related.)

Nevertheless, it is important to recognize that great social changes have occurred within these families. One important facet has been alterations in labor force behavior. The "typical" family is often illustrated as a working husband, a homemaker wife, and two children. This family type is now far from typical. In fact, in 1976, only 6 percent of all families conformed to this pattern. Even more surprising is the fact that only 15 percent of American families depended on a single earner and consisted of a working husband, a wife who did not engage in market work, and any number of children under 18 years of age.

Why is the single earner 4-person family so atypical? In part, it is because some families have passed through this stage or have yet to enter it. Also, the rising divorce rates that have been mentioned earlier have had an impact. But the most important change is that there are now more multiple earner families than single earner families. And the major cause of that statistic has been the phenomenal increase in the labor force participation of married women.

Since 1950, the proportion of women engaged in or seeking market work climbed from about one-third to nearly one-half. While the overall surge has been generally steady, noticeable differences occurred in the timing for different age groups. Prior to World War II, the highest rates of female participation were among the young, because most women left the paid labor force upon marriage. In the postwar era, this pattern changed. There was a sizable jump in the participation of women age 45 to 59, the group which had largely completed the time-consuming portion of their child-rearing responsibilities.

¹ This paper draws upon the work of many staff members in the Office of Current Employment Analysis. In particular, the author would like to note the contribution of Robert W. Bednarzik and Allyson Sherman Grossman.

Since the mid-1960's, the greatest labor force increases have occurred among women under age 45. These women, who often have young children, apparently did not decide to pursue market work until attitudes changed toward working mothers.

Furthermore, changes in fertility and childspacing patterns during the 1960's are associated with the increased likelihood that those in their twenties would work. Currently, about 60 percent of women in their twenties, and more than half of those 30 to 45, are in the labor force. Among those over 55, there have been small declines in the 1970's, indicating that some women may be choosing earlier retirement.

The dramatic increase in female labor force participation is related at least in part to an overall decline in participation among men. While the male rate remains substantially above the female rate, the gap has narrowed considerably, particularly at the younger and older end of the age spectrum. Clarence Long postulated as early as 1958 that the trends in male and female participation were related: "Women may have both pushed and pulled young and elderly males from the labor force, to some extent seeking jobs that had been or were being sought by males, and to some extent being drawn into the labor force by the vacuum left by the exodus of males for other reasons." He went on to suggest that better trained (and lower paid) women may have displaced older men, and the financial assistance of a working daughter or wife possibly permitted the man to retire at a younger age.

Thus, the biggest changes among men have occurred in the older age groups and have been attributed primarily to earlier retirement. For example, more than two-fifths of men over age 65 were in the labor force in 1950, compared to only one-fifth in 1976. The rate for men 55 to 64 dropped from 87 to 75 percent over the same period. Participation rates remain well above 90 percent for men in the prime working ages—25 to 54 years—but even in these age groups there have been some slight declines, most noticeably since the mid-1960's.

Let us return to our focus on the family. Just as changes in labor force behavior affect family dynamics, so have changes in rates of family formation and dissolution contributed to the labor force statistics just discussed. Single men, for example, have a lower rate of labor force participation than do other men, and their increasing proportion in the population has contributed to lower participation for men as a whole. Similarly, the increased proportion of divorced and never married women have contributed to greater overall female labor force participation because these groups are generally more likely to engage in paid work. Nevertheless, the most dramatic increases in female labor force participation have occurred among wives—the number of married women in the labor force nearly tripled between 1950 and 1976. One important factor in this development was fertility patterns.

From the mid-1950's to the present, the fertility of American women dropped from near record highs to record lows. This decline in fertility, which, of course, translates into smaller families, is also associated with the increase in female labor force participation. In the mid-1970's only about one-third of the wives with three children or more under age 15 were in the labor force, compared with about half of the wives with only one child in that age group. Nevertheless, despite the presence of children, even young children, women are working in

record numbers. For example, the proportion of married women in the labor force with school age children nearly doubled between 1950 and 1976 and the participation rate of wives with preschool children tripled.

Looking at the figures another way, from the perspective of the children, we can see that about 45 percent of all children living with two parents had a working mother. Younger children are less likely than older ones to have working mothers. Only about one-third of the preschool children living in husband-wife families had working mothers, compared with nearly half of those 6 to 13 years of age and more than half of all those 14 to 17 years.

Family responsibilities also affect the labor force status of men, but in different ways. Regardless of the presence or number of children, nearly all married men between 25 and 55 are in the labor force. Furthermore, married men in these ages are more likely than other men to work long hours and to hold second jobs. Reflecting the fact that family responsibilities increase the need for family income, 34 percent of the moonlighting married men but only 15 percent of other men had taken their second jobs to meet regular expenses.

Studies have indicated that the impact of children on the labor market activities of men is greatest in the older years when many delay retirement until their last child leaves home or completes school. This hypothesis is supported by William G. Bowen and T. Aldrich Finegan's finding that the larger the family, the higher the participation rates of married men over age 55.

We cannot discuss family labor force behavior without focusing on another type of family—those headed by a woman. These families are most often single parent families that consist of a mother and her children. Since 1970, the number of such families increased by one-third to 7.5 million in 1976. Currently about 1 out of every 8 families are headed by a woman and about half of these women are in the labor force, where they face higher than average unemployment.

About half of the female family heads are either divorced or separated from their husbands, about one-third are widowed, and the remainder have never been married. (Married women living with their husbands are not included in this classification.) Divorced women have the highest labor force participation of any marital category. The proportion working is particularly high—about 80 percent—for divorced women with school age children (and no children younger). Separated women have a lower participation rate; about 60 percent of separated women with school age children (and none younger) are in the labor force. Widowed women have the lowest rates of labor force activity. These women tend to be older, many of them above the typical retirement age, and they often have other financial resources such as social security payments.

Separated women face very high jobless rates, in part because they are relatively younger, less educated, and have more and younger children. Unemployment among divorced women averages just a little bit higher than that of wives.

Looking at the employment status of family members in relation to each other we see some further conformation of the extent to which

traditional assumptions about the family no longer hold true. For example, less than half of all husbands are the only breadwinner in the family. Perhaps even more striking is the fact that about one-tenth of employed wives are the only earner in their family. Thus, when a husband becomes unemployed the chances are about 50-50 that there is someone else in the family who is holding down a job. For unemployed wives, of course, it is more likely that some other family member is employed. Nevertheless in about 15 percent of families where the wife is unemployed, there is no other working member. Furthermore, wives with unemployed husbands are about 3 times as likely as other wives to be unemployed themselves. The situation is very severe among unemployed female family heads—more than 80 percent of them have no one else in their family who is employed.

The labor market problems of female headed families are underscored when we look at the unemployment rates of relatives in these families, primarily teenage and young adult children of the head. Their rates are much higher than those of comparable young people living in husband-wife families, and they are less likely to live in a family that includes a working member.

As we have seen, the family with more than one earner has become prevalent throughout the Nation. The phenomena has had pronounced effects of the living standards of American families. Thus in 1976 the median income of all husband-wife families was \$14,870. For husband-wife families with wives in the paid labor force the median income was \$17,240; this was 35 percent higher than the median income for husband-wife families in which the wives were not in the paid labor force. A recent publication by Paul Glick and Arthur Norton indicated that while most husbands earn considerably more than their wives, this is not universally the case. In about two-thirds of all families where both husband and wife worked in 1975, the husband had "perceptibly higher" earnings. In the remaining third the wife earned about what her husband did or more. It should be noted, however, that in most cases where the wife appreciably outearned her husband, his earnings were relatively low.

In part because of the relatively fewer members of working age, families headed by one adult, either male or female, have lower incomes than husband-wife families. Female headed families, in particular, have very low incomes—a median of \$6,840 in 1976. Furthermore, more than one-third of all female headed families had incomes under \$5,000 in 1976, compared with 13 percent for families headed by a man (with no wife present) and 8 percent for husband-wife families.

Looking ahead.—It seems reasonable to conclude that developments in family formation, multi-earner families, income needs, educational attainment, and retirement patterns will not reverse the current trends of increasing participation among women and decreasing participation among men. These labor force developments will have substantial impact on the family. For example, the most recent Bureau of Labor Statistics projects indicate that between 1975 and 1990 nearly 12 million women will be added to the labor force. Since most of the increase is expected to occur among women in the central

ages—25 to 54—and since the majority of these women are married, we can anticipate that the trends described above will continue, that is, more families will have more than one earner and a greater proportion of children will have working mothers. The decline in the participation rate for men over 55 years of age, which is projected to continue, may have implications for the financial well-being of families at the older age of the spectrum.

These developments tend to reinforce each other. Thus, as women's participation in the labor force is increased, they are more likely to become even more firmly attached to the labor market, unwilling to give up the income needed to maintain or increase consumption in the wake of rising prices or to leave promising careers to raise a family on a full-time basis. Moreover, any tendencies on the part of women to become more established in the work force would tend to increase the flexibility of men's labor market experience. For example, with additional family retirement income, men as well as women could retire at an earlier age. The presence of wives and younger family members in the labor force cushions the impact of male unemployment on the family. This could permit the labor force participation of men to become more responsive to economic conditions than it has been in the past.

While these trends are exciting to contemplate, we must guard against pushing them too far into the future. The longer the perspective we try to take, the more likely that unforeseen events will have an impact.

OUTLOOK FOR METRICATION

(By Michael F. Thompson,¹ Program Administrator, American National Metric Council (ANMC))

On December 23, 1975, President Gerald R. Ford signed the Metric Conversion Act of 1975, which ensures that considerable resources of the Federal Government will be employed to help bring about an efficient and economical transition to metric usage in the United States. The approval by the President and Congress marked a culmination of a legislative history which began back in 1866, with legalization of the metric system for the United States.

Frequent attempts were made over the past century to adopt the metric system as America's primary language of measurement. Action was postponed each time, partly because the metric system was not then in use by our major trading partners abroad. Now with every other major nation converted to the metric system, this obstacle has been removed.

In 1968, Congress authorized a study by the U.S. Department of Commerce to determine the effects of metrication on the American economy. A report of this study was issued in 1971 which recognized the inevitability of change and recommended that conversion be well planned. The 94th Congress saw fit that metric legislation was approved by the House (September 5, 1975) and the Senate (December 8, 1975). The act has several major features. To summarize: "... the policy of the United States shall be to coordinate and plan the increasing use of the metric system in the United States." A 17-member U.S. Metric Board is established to assist in planning and coordination of the changeover. The Board will contain representation from all sectors of the economy and will report annually to the President and Congress.

Another major feature of the bill is that the conversion will be voluntary. In other words, without explicit Government mandate, conversion will evolve within the private sector, within the Federal Government but without hard and firm timetables. Each sector of the economy will convert at its own speed based upon its own needs, opportunities, and constraints. Thus there is no specific timetable for national conversion of metrication. Individual timetables are being developed for specific industries and will continue to be developed. The act has laid down guidelines for the Board but it remains how the Board will function and just what influence it will have on the process of conversion.

¹ The views expressed in this paper are those of the author and not necessarily those of ANMC.

If you were to ask any American today on the streets of Washington, Chicago, Seattle or whatever: "What are your views on metrication?" . . . the answers would vary greatly. Many Americans have spoken out, many important Americans, many average Americans.

Noted columnist Abigail Van Buren has seen fit to also speak out recently on metric conversion.

Dear Abby: I am boiling out and need to let out some steam, so you are elected. When I start thinking about that metric system they (whoever they are) want to put over on us Americans, I get so mad I can hardly contain myself. It will cost millions of dollars to change textbooks and other publications, not to mention highway signs. Our system was good enough for our forefathers and it's good enough for me. If our neighboring countries don't like us to be different from them, let them change their system. It's too hard for us older people to change. I'm 82 and proud of it. Signed . . . Mad in Alabama.

Interestingly enough, Abby wrote back . . .

Sorry oldtimer, but the United States is the only major nation in the world still clinging to pounds, inches, gallons and acres. The whole world is adopting the metric system of weights and measures and the benefits to this country of promoting an international language of measurements are too numerous to detail here.

I will not also attempt to give a long litany of the benefits of converting to the metric system. Several publications, noted authorities and other sources will detail this information if you are still in doubt of the need and value of metric conversion. The Metric Board recently was named by President Carter and is now being reviewed by the U.S. Senate. I would expect that the Metric Board would meet sometime early in 1978 and take its position to coordinate the voluntary conversion.

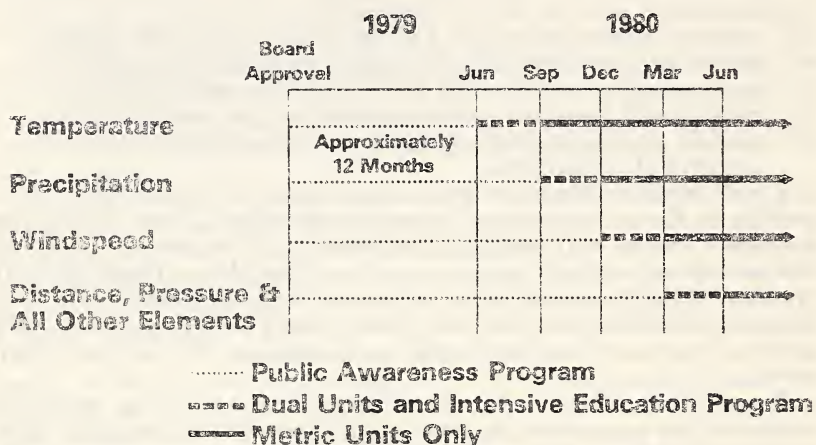
Let me take a look back . . . Where are we in going metric in America? Do we have metric products? Is it really this foreign or alien system which some of us claim? Are we that far away from total conversion? Recently, the Federal Highway Administration announced a plan for conversion of highway signs. Unfortunately, this plan was lacking in many ways and did not reflect the best judgment of many experts involved with metrication. As expected, a plan which is not top quality and lacked adequate communication, being presented to the public would receive considerable adverse reaction. This is a clear lesson to agencies, industry and to Americans in general that if we are to move toward the metric system, we must do it in a well-coordinated and cost-efficient manner. The Federal Highway Administration metric conversion plans have been tabled. This is not the end for metric conversion.

The National Weather Service has also announced a plan for metric conversion. This plan was reviewed at a June meeting, open to all parties. Maybe substantive comments were received and the officials at NWS have reviewed and incorporated these into the revised metrications plans for the National Weather Service. This initial step to secure comments from educators, consumers, the media, industry, and others

was most valuable. The plan was revised, delayed slightly, and reflected the best interest of all concerned parties. Now we're presenting this plan to the entire membership of the broadcast industry. The UPI Newspaper Advisory Board recently commented on the plan and endorsed a revision which would extend the period of duality. Many other organizations have commented on this and the Weather Service plans have grown and will receive a much better reception from the general public. The plan will ultimately be reviewed and approved by the U.S. Metric Board prior to its implementation.

PROPOSED METRICATION OF WEATHER REPORTING TO THE PUBLIC

Conversion Schedule



Here we can see the difference between two agencies. Metric conversion is no different than any other change that has taken place in America. Conversion must be logical, timely, cost effective, and foremost beneficial to America.

The American National Metric Council is a national nonprofit organization established in 1973 under the private sector's initiative. Initially under the auspices of the American National Standards Institute, ANMC established sector committees dealing with conversion in various aspects of the economy. ANMC is involved with planning, coordinating and implementing the voluntary conversion to the metric system. We currently have over 2,000 corporations, organizations and individuals subscribing to the services of ANMC and participating in the committee activities. Both Presidents Carter and Ford recognized the contributions of ANMC. I speak as a staff member of the American National Metric Council, but ANMC is much larger. ANMC is the sector members, corporations, individuals and others involved with all of our activities.

Let me speak to certain specific sectors of the economy. The Food and Grocery Products area is a vital link to the consumer as we move towards metrication. Our organization has recently broken down into a number of additional committees which directly involve such items as dairy products, meats, food services, shelf stable foods, frozen foods and others. But in moving to metrication, we also have additional problems or situations that have arisen over history. Issues, such as standardized package sizes, reduction of the proliferation of sizes, and others are involved with the change to metrication. Have you ever wondered why hot dogs come in packages of 10, while hot dog rolls come in packages of eight? Have you ever wondered why the standardized package for tuna is $6\frac{3}{4}$ ounces. These and other practices must be considered as we move towards hard metric conversion. These are not strictly metric questions but are questions that must be answered for the benefit of the American consumer in this overall transition.

Currently, metric size soft drink bottles are being sold by the following companies: 7-Up, who was first with the liter, along with Coca Cola, Pepsi Cola, Shasta, and Dr. Pepper. The Bureau of Alcohol, Tobacco, and Firearms has mandated metric sizes for wines and liquors with a 1979 and 1980 cut off date for these products respectively. So your drink in 1980 of 7 & 7 will be a metric size drink as will many others. Conversion of other food products will be somewhat slower than these items.

The textile and apparel industries are also moving ahead toward metrication. A number of manufacturers in the apparel industry are dual labeling their products at this time. Burlington Industries and Simplicity Patterns are examples of companies moving toward metrication. One of the major problems involved with conversion for the apparel industry is the critical issue of sizing. Fortunately or unfortunately, depending on your perspective, the human body is changing. We are becoming wider in certain areas and smaller in others. The problem of misfit and improper fit in clothing is growing. Before a hard conversion to metric sizes, research of the human body which will redefine the sizing patterns for American industry is required. Prior to this work, it is encouraged that dual labeling continues. A size 8 dress is merely the nomenclature to describe a product. It does not mean 8 units of anything. Whereas in men's clothing a size 40 jacket reflects a measurement sensitive product. The women of America should welcome metrication and the eventual reduction in the number of sizes and rationalization of product lines. This is another example of change, not for change sake alone. Metric conversion in clothing, especially in women's clothing, would reflect a benefit ultimately to the consumer.

The metric system has already made inroads into our lives in many ways. The role of film we have for our 35 mm camera, the 100 mm cigarette that you smoke which may or may not be a silly mm longer. The electricity that we use is measured in a metric unit. The Olympics and their events are in metric units. Educators in many ways have been leading America towards metrication. Virtually every State has incorporated some metric program into their curriculum.

Recently the ANMC Educational Materials Committee developed a practical guide for metric usage in educational materials. The "Met-

ric Guide for Educational Materials" was developed with the cooperation of over 20 publishing companies in attempts to reduce the confusion over the usage of metric units in these materials. Personally, I feel that those who continue to fuel the debates concerning the spelling and use of symbols may create only greater confusion as we move toward metrication—the "er *vs.* re" usage is only a minor problem and should not cloud the overall picture of metrication.

Employee training is another crucial area which involves the industrial and commercial educators. Many companies already involved in metric conversion have developed training programs based on their specific needs and goals. Their experiences indicate that whether a company has 5 employees or 500, the following considerations apply:

1. A need for management commitment to a single set of metric training objectives. In the absence of objectives, success or failure of a program becomes a subjective judgment;

2. Organizations must determine specific needs teaching what each person needs to know for his or her job; and

3. Everyone must use proper training techniques. They must tailor their training methods to the job to be accomplished. Determining whether self-instruction, slide tape presentations or other methods will best fit their unique situations.

The Metric Conversion Act makes no specific financial assistance plans available for business, industry, or individuals. The only program to date which has developed financial programs has been the U.S. Office of Education. The 3-year, \$10 million program USOE administers, has assisted State, local and nonprofit organizations in the development of metric programs. Subsidies to help defray conversion, which will be minimal, are not provided for within the act. One of the major misconceptions is that this bill was passed for the benefit of business and industry and that the American public will have to fend for itself during the changeover.

This is totally incorrect. The act provides for the U.S. Metric Board to "assist the public through information and education programs to become familiar with the meaning and applicability of metric terms and measures in daily life." This, of course, is a very general statement but the act does specify the Board's activities in this area will include the use of electronic and print media, talks before citizens groups, and trade and public organizations, consultation by Government with national, State and local education associations and institutions to insure that metric is included in school curriculums and the teachers are properly prepared.

The U.S. Metric Board and the American National Metric Council will work jointly toward a common goal—that being the voluntary, orderly, efficient and logical conversion of America to the metric system. Conversion should evolve rather than become a revolution. Peaceful change and gradual change is much more accepted than some quick and regulated change.

A number of State and local governments have established their own metric boards to monitor and assist local governments in planning metric conversion in areas other than education which have already been covered. Interestingly enough, former Gov. James Carter of Georgia was one of the first to work with a State Metric Conversion Board. President Carter, who does have a somewhat technical back-

ground, has endorsed the Metric Conversion Act of 1975 and promised that it will be implemented.

During conversion, the objective should be to get through the transition period as quickly as possible with a minimum of problems, misunderstandings and expense. To achieve this objective, certain things will be required. A well-coordinated education effort over a short concentrated period of time directed particularly to and involving the adult population stressing point of use and point of scale comparison information.

Spending great time on mathematical calculations to convert from the customary to the metric system would be most futile. Special attention should be paid to low-income and foreign language groups, not because of their informational needs but to insure that they understand and are able to use metric information.

For the elderly, no special programs are needed. Experience has proven in England that senior citizens understand and are able to use the metric system just as quickly as their juniors. The only special requirement they found was that that you should use large type on pamphlets.

Sources of reliable metric information in programs of assistance need good publicity, so that people know where to get accurate information. There is now, and probably will continue to be, a small amount of erroneous or misleading information and gimmickery available that may confuse people. Some means of identifying what is approved and correct may be needed, perhaps a symbol as used in Canada. The U.S. Metric Board may decide to approve or disapprove in this manner.

Introduction of the Universal Product Code (UPC) had its setbacks in the supermarket because consumers were not involved in the planning process. To avoid similar problems, metrication will need consumer involvement and support.

It is a great honor for me to be involved with a program that will affect every American in some way or another. The challenge is great but the work lies ahead for all of us. Will metrication be a costly and disruptive exercise? The answer lies only with us. Through a cooperative effort we can manage the changeover to our national advantage. The American National Metric Council is dedicated to this goal. We look forward to meeting our responsibility of planning and coordinating metrication with the support of the U.S. Metric Board. As we look back on the progress of metrication of the past years, we can take pride in the strides that have been made. But the road ahead is long, and must be organized and well planned in all aspects. Walter Cronkite, in a recent editorial, noted that metric conversion should be measured in centimeters per year rather than miles per hour. We have covered more ground than many people realize, but we still have a very long way to go. Cronkite continued,

. . . failure to change from inches to centimeters and from quarts to liters means not to trade abroad or to do so at a competitive disadvantage. Learning an entirely new system of measures may be difficult for most of us, but it can be done.

President Ford, on the occasion of signing the Metric Conversion Act of 1975, noted that we cannot become an island in a metric sea.

CLOTHING AND TEXTILES: SUPPLIES, PRICES, AND OUTLOOK FOR 1978

(By Annette Polyzou, Home Economist, Agricultural Research Service, USDA)

Between 1960 and 1977 consumer spending on clothing increased (in both current and constant dollars) due mainly to rising real disposable income and to increased concentration of the population in the age group that typically has the highest clothing expenditures. The spending for clothing, however, did not increase as much as the spending for some other items—chiefly durable goods and services. As a result, the percent of total expenditures spent on clothing declined during the period, while the percent spent for durables such as automobiles, housing, and furnishings increased. The shift in expenditures might be attributed to an increase in the number of households in the population and a resultant increase in demand for housing and household furnishings. During 1977 consumer spending continued to reflect the trend toward durables, and might reflect some consumer resistance toward the increases in the prices of apparel. Those increased prices mainly reflected increased costs for natural fibers such as cotton, wool, silk, and cashmere. During 1977 prices of cotton and wool were high in relation to the prices of manmade fibers, so textile mills produced natural-looking fabrics that contained high percents of synthetic fibers.

TRENDS IN CLOTHING EXPENDITURES AND PRICES: 1960–1977¹

Two types of data can be used in examining clothing expenditures: (1) Aggregate data on personal consumption expenditures (PCE) are supplied annually by the Bureau of Economic Analysis of the U.S. Department of Commerce. These data, which are derived from business transactions, measure total expenditures in the United States and are part of the U.S. National Income and Product accounts. The PCE data are easiest to use when they are expressed on a per capita basis (total U.S. expenditures divided by total U.S. population). (2) Household data on family expenditures are collected through nationwide surveys, such as the Consumer Expenditure Surveys (CES) of 1960–61 and 1972–73, conducted by the Bureau of Labor Statistics of the Department of Labor and the U.S. Department of Agriculture. CES data measure average family expenditures and are available for component population groups as well as for national totals. These data, however, have only been available at about 10-year intervals.

¹ Preliminary figures for 1977—based on most recent data available during October 1977.

The two types of data are not interchangeable.² The PCE data are most useful in examining trends in clothing expenditures and the CES data are most useful in developing budgets or in helping families understand their expenditures.

Nevertheless, examination of the data from both sources, between 1960 and 1977, shows similar patterns with respect to (1) total expenditures for clothing and (2) the percent of total expenditures spent on clothing.

Expenditures.—Per capita expenditures for clothing and shoes, as measured by PCE data, increased both in current and constant dollars during the period 1960–77 (table 1). In current dollars, per capita expenditures for clothing and shoes were about 152 percent higher in 1977 than in 1960. Approximately two-thirds of this increase was caused by a rise in the level of prices and one-third by increased buying—a real increase of 51 percent in dollars of constant value. Such an increase in purchase of clothing and shoes during this period might be attributed to rising incomes as well as to a change in the composition of the population. Real disposable income was 89 percent higher in 1977 than in 1960, according to the Department of Commerce series on personal income and outlay. The composition of the population during those years reveals an increasing proportion of individuals in the 14–34 age group (table 2). Those individuals typically have the highest clothing expenditures that result from new clothing needs associated with sporting activities, dating, entering college, or beginning careers (1). Individuals in that age group also tend to be more fashion conscious than individuals in other age groups and may thus accept fashion changes more quickly. The increase in 14–34 year olds was partially offset by a slight increase in the proportion of individuals age 55–65 plus. They typically spend less on clothing than other individuals due to the decreases in clothing needs and income, which result from retirement from the labor force, and to a reduced level of physical activity. Projections of the population for 1980 indicate that the composition will be virtually the same as that for 1976—the greatest proportion of the population will be individuals with the highest clothing expenditures. Thus, real increases in per capita clothing expenditures, on an aggregate basis, are likely to continue at their present levels during the next few years and perhaps to increase as real disposable personal incomes rise; however, future increases are likely to be at a slower rate since projections indicate no further growth in the 14–34 age group.

As measured by the CES data, average family expenditures on clothing, materials, and services, including all laundry and dry cleaning services, were 17 percent higher in current dollars in 1972–73 than in 1960–61 (table 3). In constant dollars, however, average family expenditures dropped by about 13 percent between 1960–61 and 1972–73. That drop might be attributed to a decline in family size. The data collected separately by CES and by the Bureau of the Census show a decline in average family size between 1960 and 1970. Smaller families generally buy fewer clothes. Data from the Bureau of the Census shows that average family size continued to decline during the period 1972–73 through March 1977 from 3.51 persons to 3.37 persons. That decline

² For a more detailed discussion of the differences in aggregate and household data, see *Family Economics Review*, December 1970.

suggests the possibility that family expenditures on clothing may have continued to decline in recent years.

Percent of total spending for clothing.—In both current and constant dollars, the percent of total personal consumption expenditures (PCE) spent on clothing and shoes declined during the period 1960–77. In current dollars, clothing comprised 8.2 percent of personal consumption expenditures in 1960 and 6.8 percent in 1977. In constant dollars, clothing comprised 8.1 percent of personal consumption expenditures in 1960 and 7.7 percent in 1977. Clothing, as a percent of total personal consumption expenditures, declined at a faster rate in current than in constant dollars because prices for all items of personal consumption expenditures increased at a faster rate than prices for clothing.

The CES data are consistent with PEC indications of a decline in clothing expenditures as a percent of total personal consumption expenditures. Clothing expenditures as a percent of total consumption expenditures—were lower in 1972–73 than in 1960–61 in both current (7.8 percent versus 10.9 percent) and constant dollars (7.8 percent versus 10.2 percent).

The downward trend in clothing as a percent of total expenditures parallels a downward trend for nondurables in general. Expenditures have shifted away from nondurable goods toward durable goods such as automobiles, furniture, and household equipment, and services such as housing, household operation, and transportation. According to the PCE data, nondurables declined from 46 percent of personal consumption expenditures in 1960 in constant dollars to 39 percent in 1977, whereas durables rose from 12 to 16 percent and services rose from 42 to 45 percent during the same period. The CES data show a similar trend toward the purchase of durables and services at the expense of nondurables. The trend toward durables may be partially attributed to an increased rate of new household formation, during the 1960–77 period, resulting from a greater proportion of individuals aged 14–34 who either live away from home before marriage or get married and form new households. The formation of new households is typically associated with increased demand for durable goods and services, such as automobiles, housing, and household furnishings.

Attitudes toward clothing also have changed in recent years. Most individuals have adopted a casual lifestyle that has brought about a relaxed attitude toward clothing (2, 4). Jeans have become a major influence on apparel as have separates that provide variety through mixing and matching garments and allow inexpensive replacement of components. There has also been greater use of active sportswear, such as jogging suits, as streetwear. Consumers' interest has also shifted in recent years from faddish items to garments with basic utility and permanence. Trade sources expect consumers to purchase a few higher-priced, better-quality garments with more durability for long-lasting wear rather than many lower-quality faddish items.

Clothing expenditures and prices during 1977

Consumer expenditures for clothing and shoes averaged \$373 per person during the first three quarters of 1977, according to preliminary figures (table 1). Although that amount is \$18 higher than the corre-

sponding amount in 1976, nearly two-thirds of the increase resulted from a rise in the level of prices rather than from increased buying.

The price level for apparel and upkeep, as measured by the Consumer Price Index (CPI), averaged 4.6 percent higher during the first three quarters of 1977 than during the same period in 1976 (table 4). Increases among the three apparel subgroups averaged 4.6 percent for men's and boys' clothing, 3.3 percent for women's and girls' clothing, 4.9 percent for footwear, and 5.2 percent for other apparel commodities. Such increases for apparel items were less than the 6.4 percent increase for all items of the CPI.

Retail sales of apparel were generally weak during the first quarter of 1977. Abnormally cold weather during January and early February caused an increase in home-heating fuel usage as well as a rise in fuel prices and in weather-affected food prices, thus reducing consumers' discretionary income for retail purchases. The severe cold did strengthen sales of sweaters, thermal underwear, hats, and gloves. As the effects of the severe weather abated and personal income increased substantially during the latter half of the first quarter, consumer spending rapidly increased. Strong sales of durables, mainly automobiles, major appliances, and furniture, indicated that consumers may have purchased such big-ticket items in anticipation of future price increases resulting from the rise in fuel prices. Consumers also invested in home improvements, such as storm windows and home insulation, presumably to reduce energy usage.

The durables trend continued to be strong during the second quarter and affected sales of automobiles, appliances, garden and nursery equipment, sporting goods, and related items. Various trade sources cited several possible reasons for the weak apparel sales during most of the second quarter:

- consumers' resistance to higher prices of apparel,
- consumers' strong interest in housing and automobiles,
- consumers' concern about energy and long-term inflation.

Retailers responded to sluggish apparel sales by promoting aggressively and cutting prices in hope of creating some consumer interest. Retailers also kept inventories lean and depended on quick delivery of fast-moving items. Unseasonably warm weather during May created strong consumer demand for active sportswear and athletic footwear for all family members. Other factors that influenced the growth of active sportswear during this period included increased use of such sportswear as streetwear, increased attention on physical fitness and continued emphasis on sports activities as social affairs.

The sales pattern of the third quarter again favored durables (especially automobiles) over softgoods although apparel sales strengthened somewhat during this period. Consumers responded well to clearance prices on summer items and back-to-school merchandise early in the quarter. Retailers realized that consumers had been increasingly more price conscious throughout the year. Thus, they stressed price over fashion during the back-to-school season and offered basic merchandise such as corduroy and denim jeans, knit tops, flannel shirts, shetland pullovers, and down jackets and vests at competitive prices. According to several trade sources, prices for most fall apparel items for men

and women were 5 to 15 percent higher than a year ago. Higher prices of fall apparel mainly reflected increased costs for such natural fibers as cotton, wool, silk, and cashmere as well as increased yardage for the fuller fashions for women—tiered and double skirts, full dresses, and big blouses. Consumers did not seem adverse to spending extra money for better quality apparel which suggested that they may be viewing the purchase of apparel as an investment. Retailers cited some price resistance toward lower and moderate-priced apparel during the fall season, and responded with aggressive advertising and promotion and tight control of inventories.

The seasonally adjusted wholesale price index for apparel rose 0.7 percent during the period June through September. This indicates the probability of price increases for apparel at the retail level during the months ahead.

With higher prices of apparel, consumers may wish to take advantage of this year's fashion emphasis on separates and create ensembles from jackets, vests, sweaters, shirts, pants, and skirts coordinated by color and/or fabrication. Consumers can also stretch their clothing dollar by utilizing the separates concept to build on last year's wardrobe. Also, with the onset of cold weather, consumers can use apparel as an insulation against the cold and as an aid in saving fuel costs by layering garments and wearing sweaters.

CONSUMPTION AND PRICES OF FIBERS DURING 1977

U.S. per capita mill use of natural fibers was lower this year than last, while mill use of manmade fibers was higher. Estimated U.S. per capita mill use of all fibers in 1977 (based on data for the first 9 months) is about 55.6 pounds, including 14.5 pounds of cotton, 0.5 pounds of wool, and 40.5 pounds of manmade fibers. This compares with 1976 per capita use of 54 pounds, including 15.9 pounds of cotton, 0.6 pound of wool, and 37.6 pounds of manmade fibers. The natural look in clothing has continued to be important during the year, but high prices of cotton and wool, relative to prices of manmade staple fibers, have influenced textile mills to achieve natural looks with blended fabrics containing a higher percent of synthetic fiber. This is apparent in the denim market where mills are offering denims in 80/20 and 65/35 cotton/polyester blends. Blends now account for nearly 30 percent of the denim market. Even corduroy, which has traditionally been all-cotton, is being offered in blends of 84 percent cotton and 16 percent polyester and of 50/50 cotton/polyester. Other natural-looking fabric blends available in the market for men's and women's clothing include polyester blended with wool, silk, linen, viscose rayon, and acrylic, as well as acrylic blended with wool. Research in the area of textiles is focusing on the development of easy-care synthetic fabrics with a natural hand. Textile Industries³ recently introduced such a synthetic fabric—a lightweight all-polyester fabric

³Reference to a company name is used in this publication solely for the purpose of providing specific information. Mention of a company name does not constitute a guarantee or warranty of the company by the U.S. Department of Agriculture or an endorsement by the Department over other companies not mentioned.

coated with a finish to allow moisture absorption. Another recent development, air texturizing, fluffs up acrylic yarn to impart a mohair-like appearance to the fiber.

U.S. mill consumption of cotton for the first 9 months of 1977 was about 9 percent lower than during the same period in 1976. Mill use of manmade staple fibers gained about 8 percent over 1976. The decline in mill consumption of cotton was attributed to the rather static textile activity and relatively high cotton prices in relation to manmade staple fiber prices.

Mill-delivered cotton prices have declined from a high of 83 cents per pound in March to 57 cents in September. This is about the same price that mills are presently paying for manmade staple fiber. The decline in cotton prices during this period was mainly due to prospective abundant supplies of cotton in relation to weakening demand. The 1977 cotton crop is about a fourth larger than last year's crop due to increased cotton acreage and favorable growing conditions during the summer. Diminished domestic demand for cotton is reflected in the decline in mill consumption of cotton as previously mentioned. Foreign demand for cotton has also weakened. Exports of cotton during the 1977-78 marketing year are expected to total slightly below last season's 4.8 million bales. However, currently lower cotton prices are expected to stimulate U.S. mill consumption of cotton in 1978 and may reverse the trend toward cotton/polyester blends in the denim market.

Mill consumption of raw apparel wool during the first 8 months of 1977 was about 12 percent lower than during the same period in 1976, reflecting a shift to higher synthetic fiber content in blends due to high wool prices. Average U.S. farm prices for wool have declined from a high of about 75 cents per pound in January to 71 cents in September, but are still above 1976 wool prices.

Shipments of manmade fibers by U.S. producers during the first 8 months of 1977 were approximately 11 percent higher than in the same period in 1976, according to *Textile Organon* (September 1977). According to fiber producers, price increases during the year for selected acrylic, rayon, nylon, acetate, and polyester fibers mainly reflected increased costs of energy, raw materials, and labor. Currently, acrylic is benefiting from strong fall/holiday sweater sales, nylon is benefiting from strong sales of down-proof nylon parkas, and skiwear and other sports outerwear, and polyester is benefiting from a revived interest in polyester/rayon slacks as well as a shift in production from all-cotton to cotton/polyester denims.

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TABLE 1.—ANNUAL EXPENDITURES ON CLOTHING AND SHOES¹

| Years | Per capita expenditures ² | | Percent of expenditures for personal consumption | | Aggregate expenditures | |
|-------------------|--------------------------------------|-----------------|--|-----------------|-------------------------------------|-----------------------------|
| | Constant dollars (1972) | Current dollars | Constant dollars (1972) | Current dollars | Billions of constant dollars (1972) | Billions of current dollars |
| 1960 | 203 | 148 | 8.1 | 8.2 | 36.6 | 26.7 |
| 1961 | 203 | 149 | 8.1 | 8.2 | 37.3 | 27.4 |
| 1962 | 209 | 154 | 8.1 | 8.1 | 38.9 | 28.7 |
| 1963 | 209 | 156 | 7.9 | 7.9 | 39.6 | 29.5 |
| 1964 | 222 | 166 | 8.1 | 8.0 | 42.6 | 31.9 |
| 1965 | 227 | 172 | 7.9 | 7.8 | 44.2 | 33.5 |
| 1966 | 239 | 186 | 8.0 | 7.9 | 46.9 | 36.6 |
| 1967 | 236 | 192 | 7.8 | 7.8 | 46.9 | 38.2 |
| 1968 | 242 | 208 | 7.7 | 7.8 | 48.6 | 41.8 |
| 1969 | 245 | 223 | 7.6 | 7.8 | 49.6 | 45.1 |
| 1970 | 240 | 227 | 7.4 | 7.5 | 49.2 | 46.6 |
| 1971 | 249 | 244 | 7.5 | 7.6 | 51.6 | 50.5 |
| 1972 | 264 | 264 | 7.5 | 7.5 | 55.1 | 55.1 |
| 1973 | 281 | 291 | 7.7 | 7.6 | 59.2 | 61.3 |
| 1974 | 279 | 308 | 7.8 | 7.3 | 59.1 | 65.3 |
| 1975 | 288 | 329 | 7.9 | 7.2 | 61.5 | 70.2 |
| 1976 | 301 | 355 | 7.9 | 7.0 | 64.7 | 76.3 |
| 1977 ³ | 306 | 373 | 7.7 | 6.8 | 66.2 | 80.9 |

¹ Data shown for 1960 through 1976 differ from data given in previous papers on the outlook for clothing and textiles. The revisions resulted from changes in definitions of personal consumption expenditures (other than clothing and shoes) statistical revisions of previous estimates, and revisions in population figures for 1975 and 1976. More detailed information can be obtained from the Survey of Current Business and Current Population Reports (see sources below).

² Calculated by dividing aggregate expenditures for each year by population figures for July 1 of each year.

³ Preliminary figures—average of estimates for 1st 3 quarters of 1977 (i.e., seasonally adjusted quarterly totals at annual rates).

Sources: U.S. Department of Commerce, Bureau of the Census, 1977, Population Estimates and Projections, Current Population Reports, series P-25, No. 706 (table c). U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business (tables 2.3 and 2.4), 1976, 56(1), pts. I and II, and 1977 57(7); and personal communication with the Bureau of Economic Analysis.

TABLE 2.—COMPOSITION OF POPULATION BY AGE

| Year | Total population (thousands) | Percent of population by age | | | |
|-------------------------|------------------------------|------------------------------|----------|----------|---------------|
| | | Under 14 | 14 to 34 | 35 to 54 | 55 to 65 plus |
| 1960..... | 180, 671 | 30 | 28 | 25 | 18 |
| 1970..... | 204, 878 | 25 | 32 | 23 | 19 |
| 1976..... | 215, 118 | 22 | 36 | 22 | 20 |
| 1980 ¹ | 224, 066 | 21 | 36 | 22 | 21 |

¹ Projections.

Source: U.S. Department of Commerce, Bureau of the Census, "Current Population Reports, Population Estimates and Projections," series P-25, No. 704, July 1977, Projections of the Population of the United States: 1977 to 2050, table H.

TABLE 3.—COMPARISON OF 1960-61 AND 1972-73 CES DATA¹

| Item | 1960-61 | 1972-73 |
|---|---------|---------|
| Current dollars: | | |
| Average total consumption expenditures..... | 5, 054 | 8, 282 |
| Average expenditures on clothing, materials and services..... | 553 | 647 |
| Clothing expenditures as a percent of total consumption expenditures..... | 10.9 | 7.8 |
| Average family size..... | 3.2 | 2.9 |
| Constant 1972 dollars: | | |
| Average total consumption expenditures..... | 7, 328 | 8, 282 |
| Average expenditures on clothing, materials, and services..... | 747 | 647 |
| Clothing expenditures as a percent of total consumption expenditures..... | 10.2 | 7.8 |

¹ 1972-73 preliminary data.

Source: U.S. Department of Labor, Bureau of Labor Statistics, 1977, Changes in consumer spending patterns, News, USDL: 77-428, pp. 1-5.

TABLE 4.—ANNUAL PERCENTAGE CHANGE IN SELECTED INDEXES OF CONSUMER PRICES

| Consumer Price Index | 1973 | 1974 | 1975 | 1976 | 1977 ¹ |
|--|------|-------|------|------|-------------------|
| All items..... | +6.2 | +11.0 | +9.1 | +5.8 | +6.4 |
| Apparel and upkeep ² | +3.7 | +7.4 | +4.5 | +3.7 | +4.6 |
| Men's and boys' clothing..... | +3.7 | +7.9 | +4.3 | +3.5 | +4.6 |
| Women's and girls' clothing..... | +3.5 | +6.0 | +2.4 | +2.8 | +3.3 |
| Footwear..... | +4.2 | +6.1 | +4.4 | +4.0 | +4.9 |
| Other apparel commodities ³ | | | | | +5.2 |

¹ Preliminary estimates—average for 1st 3 quarters of 1977 compared with the average for 1st 3 quarters of 1976.² Also includes infants' wear, sewing materials, jewelry, and apparel upkeep services, for which indexes are not available.³ Developed in 1976 to include diapers, yard goods, earrings, wrist watches, and zippers.

Source: U.S. Department of Labor, Bureau of Labor Statistics, 1977, News, Consumer Price Index (monthly issues); and personal communication with the Bureau of Labor Statistics.

ENERGY EXTENSION SERVICE

(By Judith M. Liersch,¹ Director, Energy Extension Service, DOE)

The Energy Extension Service (EES) is presently operating as a pilot program in 10 States. As a pilot program, it provides a promising experiment in energy outreach which can be used to develop a rational and effective nationwide program.

BACKGROUND

The enabling legislation for the Energy Extension Service is title V of the Energy Research and Development Administration's (ERDA) fiscal year 1978 authorization bill (P.L. 95-39) which was signed into law June 3, 1977. A review of the legislation indicates the following points of congressional concern and intent:

- The bill's sponsors were concerned that creating general awareness of the energy problem would not be enough. Individuals need the knowledge and capability to use conservation and alternative energy technologies on a specified basis, as well as to understand the energy problem.
- Current Federal energy outreach efforts were viewed as piecemeal approaches without coordination and overall planning.
- The underlying philosophy is to create an outreach approach, heavily dependent on State participation, as an effective way to ensure individual capability to adopt suitable energy saving techniques and technologies.

The concept of direct assistance to consumers inherent in EES stems from the Cooperative Extension Service (CES) model where CES acts as a major force and catalyst for widespread change at the local level. The record shows many references to the congressional intent that the EES follow the CES model to provide grass-roots delivery of relevant information and assistance and the follow through to be sure this is timely, on target and thoroughly understood.

A major departure from the CES model is that there is no single equivalent to the land grant college system in energy to administer and provide technical support to EES. Rather, in EES the State government administers the program and the technical base is understood to exist in different institutions in each State, including the land grant institutions. ERDA was selected to implement the EES since ERDA was close to this technical base which is critical to the program success. With the reorganization of the energy agencies, the Department of Energy is assuming the role of managing the EES.

¹ The views expressed in this paper are those of the author and not necessarily those of the USDA.

PURPOSE AND OBJECTIVES

The major purpose and the bottom line of the EES is to increase energy savings and the substitution of renewable for nonrenewable fuels. This is to be accomplished by providing small energy consumers with an accessible, reliable and creditable source of assistance.

Small consumers specifically targeted by EES include individuals, small institutions and business establishments and local governments. History has shown that these are the least well prepared energy users for coping with current energy problems. EES aims particularly to teach small users to be better able to cope with rising energy prices and potential fuel shortages.

Finally, it is assumed that EES target audiences, in the course of receiving extension services, will report on the institutional and other barriers perceived to be preventing adoption of the energy saving measures being promoted. EES cannot necessarily overcome these barriers, but can initiate a systematic process for collecting such information and transmitting it for follow-up action to public and private organizations at Federal and State levels. Thus, an opportunity is created for regulators, legislators, administrators, and technology developers to take action to overcome some of the barriers impeding use of energy saving methods and equipment.

PROGRAM HIGHLIGHTS

One of the major program highlights is face-to-face assistance to small energy consumers. In addition to this emphasis on personalized assistance, another special aspect of EES is the State role in planning and operating the program. We are committed to the philosophy that States must have the flexibility to design program measures which are suited to their particular energy circumstances.

In the area of technical assistance, DOE/EES operates as a "whole-saler" and one which must be very responsive in efficiently supplying the States with technical information and training assistance they specifically require. The DOE/EES technical assistance team is working with the pilot States to identify their specific needs and to provide service characterized by quick turnaround on technical questions. Further action involves finding public and private information resources for the States, then facilitating contact. The overriding aim is to build technical capability within the States and an ability to benefit from the resources already available.

A recurring theme throughout the development of the program is not to "reinvent the wheel." DOE/EES encourages the States to design their programs to tie directly into and supplement existing programs and service mechanisms wherever possible thus enabling States to achieve a multiplier effect by tapping into the best services available throughout the State.

To maximize the benefit of lessons learned, we have given the nonpilot States a head start in developing an energy outreach program. Each nonpilot State has access to a small grant to be used to track the pilot program. In addition, the pilot States have each budgeted a half-man year of effort for information sharing with the non-pilot States. DOE/EES also makes available to these States activities

such as a recently held technical information short course held at the DOE Technical Information Center in Oak Ridge, Tennessee.

PILOT TEST FEATURES

There are a number of special approaches with which DOE/EES is experimenting in the pilot program and which may have broader application.

- DOE/EES is pursuing a simple and economic evaluation to determine the overall implementation approach, and specifically, what works best, what doesn't and why. The basic elements to the evaluation are a rigorous evaluation design coupled with systematic data collection and monthly interviews with State personnel associated with the EES programs. In the 18 months of operation of the pilot program, it is probably not possible to achieve definitive answers but trends will emerge to guide any future efforts.
- The pilot program is set up to test the interaction between DOE/EES program management in the field and in Washington headquarters and to work out a viable communications system between field and headquarters. One of the three State program officers working with DOE/EES is located in Denver and works with three Western/Southwestern States. Clearly a national program will call for a significant role for DOE/EES personnel located in offices in the field.
- In order to facilitate and encourage information sharing among the pilot States, and between the States and DOE/EES, an informal Pilot State Council is being set up. One of the major roles of the Council will be to recommend to DOE the activities to be funded by a special projects fund. This is a \$700,000 reserve designed to enable the States to undertake projects to meet needs which were not anticipated at the time the proposals were submitted in July, projects which benefit two or more States, or generally, more innovative high risk projects which may be experimental in design.
- The pilot program will give DOE an opportunity to test the concepts and approach to collecting barrier information and feeding this back to decisionmakers in a position to take action on the barriers preventing adoption of energy techniques and technologies.

PILOT PROGRAM UPDATE

The 10 pilot States were selected competitively in August 1977 from among 50 proposals received by ERDA/DOE for the Energy Extension Service. The proposals were selected on technical merit and to represent a mix of program and management approaches as well as a broad geographic representation. Grants were awarded in September to each State for \$1.1 million for the 19-month pilot period.

The 10 pilot States are: Alabama, Connecticut, Michigan, New Mexico, Pennsylvania, Tennessee, Texas, Washington, Wisconsin, and Wyoming.

The States are currently preparing detailed implementation plans to assure that resources are appropriately allocated to accomplish the activities in the State proposals. When the plans are completed at the

end of November they will provide a detailed basis for tracking the programs and for constructing effective evaluation models for each State. Some services will be offered in the pilot States by the end of the year.

Several services are common to all the pilot States: energy audits, seminars, workshops and training, information dissemination to residential dwellers, and energy hotlines. These services are targeted for residential consumers, small commercial establishments and public institutions. Such commonality of services and target audiences should assist DOE/EES in drawing practical lessons which can assist energy extension services in different regions at such time as the program is expanded.

Each pilot State, however proposes to expand on or initiate some service that is different from the others or approaches the service in some unique way. For instance:

- Alabama* will offer car care clinics
- Connecticut* plans consumer education on peak load pricing
- Michigan's* ESS will include vocational education in energy conservation
- Texas* is preparing seminars for savings and loans officers to assist them in assessing energy conservation loan requests
- Wyoming* will offer home energy audits using para-professionals

The implementation approaches by the pilot States are quite varied. In terms of management, five States will focus EES management on the State government; three will use universities; and two have hybrid organizations combining both university and State government elements. Some States, like Wyoming, plan to deliver services statewide. Others, like Washington, are targeting narrowly defined geographic areas. All the States in one way or another use delivery support from sources other than the managing unit. For instance, seven States will provide services with assistance from the Cooperative Extension Service. In Pennsylvania, the EES will be aided by the well-established Pennsylvania Technical Assistance Program (PENNTAP).

An interagency working group has been established to serve as a focus for providing DOE with comments on EES implementation and other information that might be of use to the pilot States. It is expected that the working group will become a vehicle for coordinating Federal efforts to provide technical assistance to small energy consumers. Relations are being established with national associations and we are just beginning to coordinate our activities with the new program offices in DOE.

DOE issued the announcement of grants to the nonpilot States on October 14 and responses are due in by December 9. All of the States and many of the territories have indicated that they intend to reply. Clearly, there is tremendous interest in this type of energy program in the States.

Finally, we have two other activities underway which were required by the enabling legislation: the Comprehensive Plan and Program and the National Advisory Board.

In response to congressional concern that the Federal Government coordinate its activities for developing energy information, education and outreach, EES and related Federal energy agencies are preparing

a comprehensive program and plan for beginning the process of planning an integrated effort. The first report will describe the status and objectives of existing programs and some of the lessons learned by the various programs, some of which may have broader application. We hope that the report will stimulate further action for coordination among the programs when it is submitted to the President and Congress in December.

DOE, which accounts for 45 percent of the energy outreach activities undertaken by the Federal Government, is already in the process of consolidating its programs in response to the general philosophy inherent in the formation of DOE. In addition, the National Governors' Association is undertaking an initiative to effect consolidation of the planning for energy programs sponsored under Federal grants. DOE has played an active role in legislative preparation and we anticipate introduction of the initiative in fiscal year 1978.

A National Advisory Board required by the enabling legislation is still in the design stage. Early next year we will have a proposal on structure and functions of the Board ready for consideration. We expect that the Board, which will represent the concerns of the EES target audiences will provide a useful arena for consideration of major EES policy decisions.

This is a general overview of the development of the pilot EES and the possibilities for effective cooperation on all sides. Building on the example of the Cooperative Extension Service and working with USDA and others, we will help small energy consumers to cope with the potential dangers of our energy future, and we will assist the Nation in meeting the ambitious, but essential goals set forth in the President's Energy Plan.

IN-HOME ENERGY MONITOR: A TEST OF CONSUMER RESPONSE TO ENERGY INFORMATION

(By R. Bruce Hutton,¹ Ph. D., Program Manager, Consumer Motivation Branch, DOE)

INTRODUCTION

The Office of the Assistant Secretary for Conservation and Solar Applications, Division of Buildings and Community Systems, has responsibility for encouraging more efficient use of energy in the buildings sector. To date, the majority of efforts of the Division have focused on technical product and system development. It is becoming more and more evident that consumer awareness as well as motivating the consuming public, whether commercial or retail, is as important and difficult a change as developing the technologies. For example, there are many sound energy conserving products already available in the marketplace, such as insulation. Most have not achieved rapid and widespread use even though they can be justified in terms of a sound economic investment. In addition, there are many practices, such as reducing winter thermostat settings and/or increasing summer air-conditioning settings, that homeowners could adopt which would substantially reduce their energy consumption. Clearly, these actions would be in both the individual and national interest, since they would conserve our supplies of fossil fuels and reduce the cost of energy to consumers. Yet, consumers have not widely adopted energy efficient practices or made more energy efficient purchase decisions. The Consumer Motivation Branch (CMB) is now conducting research on ways to work with the private sector to encourage residential consumers to (1) purchase more energy efficient products and (2) adopt more energy efficient practices.

FEEDBACK

A great deal of psychological research has suggested that giving immediate feedback to an individual about the effects of his actions enables him to better control his actions. The application of this idea to the reduction of energy consumption is clear. There is a general concern with homeowners about energy, and they are motivated by continually increasing energy costs and other pressures to reduce their home energy consumption. Consequently, if they are given rapid feedback on their actual energy usage, especially in dollars and cents, this should enable them to better control their consumption. There are two main reasons why this effect might occur. First, since most homeowners

¹The views expressed in this paper are those of the author and not necessarily those of the USDA.

are unaware of the amount of energy they use (the monthly utility bill is not clear or detailed enough to be very helpful), feedback provides information about energy use. Second, instant feedback indicates the success of various attempted conservation strategies which can lead the homeowner to discover and maintain conservation habits.

Research funded by CMB and conducted by Princeton University has dealt directly with the feedback concept. (Full details of this preliminary research leading up to the current Energy Monitor Study are available in "Psychological Strategies to Reduce Energy Consumption: First Annual Report," Center for Environmental Studies, Princeton University, Princeton, New Jersey 80540). Four experiments were conducted.

The objective of the first was to modify the rate of summer electricity usage associated with central air-conditioning. Feedback consisted of giving the homeowners a percentage score which informed them whether they were consuming electricity at a rate greater than, less than, or equal to the rate predicted for them on the basis of their own previous month's consumption. Conservation achieved by providing homeowners with daily, weather-corrected feedback was about 10.5 percent.

The other experiments involved variations on the basic feedback theme. In the second one, consumers were either given a difficult specific goal to reach in terms of conservation (i.e., reduce energy consumption by 20 percent) in addition to the feedback or an easy goal (i.e., reduce energy consumption by 2 percent). Homeowners given the difficult goal plus feedback reduced consumption 13.4 percent compared to the control and 4.6 percent for the easy goal group. The other two experiments dealt with different types of feedback (e.g., feedback comparing it to other peoples consumption data, their own consumption in another time period, in terms of the physical characteristics of the house). Results here were much more equivocal than the other two, although the feedback did show some positive effect. Overall, results supported the theory that feedback helps homeowners reduce energy consumption, but the optimal nature of the feedback system had yet to be identified. In addition, the procedures used thus far were not feasible on a large scale since we had assistants sent on foot to homes to read meters, compute feedback and mark charts.

At this stage, CMB was now ready to test, in cooperation with Potomac Electric Power Company (PEPCO), the effectiveness of a relatively simple device which would automatically provide homeowners with immediate information about their home's energy consumption. In addition, running concurrently with this test, research and development of a more sophisticated, multi-function feedback device is being done by the Department of Energy's (DOE) Consumer Products and Technology Branch.

OBJECTIVES

The purposes of the experiment using the energy monitor are (1) to test whether a simple, one function device which instantaneously displays projected hourly electricity cost will be effective in helping families conserve energy and (2) to find out what practical difficulties

may arise in doing this type of real world test with a utility, for example:

- utility support and reactions
- customer response/level of inquiries
- installation and maintenance costs
- data collection

FITCH ENERGY MONITOR

The Fitch Energy Monitor, developed by R. B. Fitch, an energy conscious builder/developer in North Carolina, is being used in this test. The device is commercially available at this time, although this will be the first controlled test of its effectiveness. It provides a display in cents-per-hour of total household electricity use (to tenths of a cent), i.e., "Your electricity cost for the next hour will be \$0.742 if you continue to use electricity at your present rate." If the consumer then plugs in his dishwasher, the cost will immediately jump to a higher figure (e.g., \$0.953). The device also serves as a conventional digital clock. It alternates time of day and cents-per-hour at 4-second intervals. The Fitch Energy Monitor will be placed in the homeowner's kitchen.

This particular feedback device was chosen for a number of reasons. A primary one is consumer cost. While the monitor is not currently in mass production and therefore sells for \$125, mass production could bring down the cost to the consumer to around \$25. The payback period is then likely to be less than one year. Other, more sophisticated meters are being developed, but this is probably the most cost effective for the consumer at this time. Other reasons for choosing the meter were the immediacy of the data and the continual reminder to the consumer that energy is being used in the home at virtually all times.

OVERVIEW OF THE TEST

DOE is providing the feedback devices, the research and evaluation support (through Princeton University) and coordination with other ongoing efforts for the experiment. PEPCO is in the process of installing and will maintain the feedback devices and monitor electricity consumption of the participants in the study. Based on what is learned in the test, a larger scale demonstration involving several utilities and perhaps a more sophisticated device will be developed for implementation in fiscal year 1978.

Participants and Design: With PEPCO's assistance, 140 families were selected based on a stratified random sample of customers from the PEPCO service area. These families were then randomly assigned to either the feedback group or the control group (seventy families each). The subjects in each group represent a broad demographic profile of PEPCO customers, especially in terms of income. All participating families have been visited by a Princeton researcher and a PEPCO engineer who fully explained the details of what the customer's involvement will be and provided educational materials on how to most effectively conserve energy. The test will begin this fall and will run for one year, since the long term effectiveness of such a feedback device is of major interest.

Data Collection: PEPCO is also in the process of installing a demand meter in the homes of all families participating in the study (both feedback and control) which will monitor amount and time of electricity use on a continual basis. This will enable us to assess the effectiveness of the feedback in reducing overall electricity consumption, and also determine the impact of this type of feedback on the utility load profile.

In addition, homeowners' efforts to save energy and reactions to such factors as the device itself, the utility role, and the costs of energy will be monitored during the study and documented.

CONCLUSION

The overall objective of the CMB is to encourage private sector groups such as financial institutions, retail merchants, and utilities to voluntarily work with DOE to test and evaluate approaches which the private sector could later implement to motivate consumers to become more efficient users of energy. Funding for such projects undergo comprehensive review as well as project evaluation by the Planning Analysis and Evaluation Branch. Projects are evaluated according to the following:

- National energy impact
- Public cost
- Private cost
- Cost-sharing
- Economic benefits
- Technical and institutional feasibility

It is felt that the concept of instant energy cost feedback has the potential to help achieve national energy savings by cost effective means. The results of our study next year will determine exactly what kind of impact may be expected, and will determine future courses in this area of energy conservation.

CONSUMER PRODUCTS EFFICIENCY AND LABELING PROGRAM

(By R. Nelson DuRant, Jr., Senior Program Analyst, Office of Consumer Products, Department of Energy (DOE))

This afternoon, I would like to provide you with an overview of the DOE's Consumer Products Efficiency and Labeling Program. I will be discussing the legislative requirements of the Energy Policy and Conservation Act (EPCA) as they pertain to the consumer products program, our accomplishments to date, the legislative requirements remaining to be implemented along with a timetable for completion, and other issues inherent in the program. I will also address program changes that will occur if the National Energy Act passes in its present form.

The Consumer Products Program is mandated by title III, part B of EPCA, which was passed on December 22, 1975. The primary objective of the program is to reduce energy consumption in the household sector by improving the operating efficiency of major household consumer products. This objective, translated into energy savings, amounts to a reduction of energy consumption in the year 1985 of approximately 200 million barrels of oil equivalent per year.

Under the existing legislation, DOE, working in conjunction with the Federal Trade Commission (FTC) and the National Bureau of Standards (NBS), is tasked to address four major program objectives. These are: test procedures, energy efficiency improvement targets, consumer product labeling, and consumer education.

There are 13 covered product categories specified in the EPCA. Under requirements of EPCA, energy efficiency improvement targets for the first 10 product types must achieve an aggregate energy efficiency improvement of not less than 20 percent by 1980 over like products manufactured in 1972. This will be discussed in more detail later in the presentation.

Turning now to the four major program elements. Section 323 of EPCA requires that test procedures be developed which are designed to measure the energy efficiency of a consumer product and to provide a determination of an estimated annual operating cost during a representative average use cycle. NBS has the responsibility for developing the initial test procedures and making recommendations to DOE. Test procedures for most product types are different from those used by industry in that they are required to measure energy efficiency and energy consumption during a typical average use cycle. For some product types such as television sets, the representative average use cycle is nothing more than the number of hours per year a television operates which is 2,200 hours or 6 hours a day, or for clothes washers, the

number of cycles per year a clothes washer is operated, which is 416. For other products, such as air-conditioners and furnaces the task is not quite as simple. For these type products that cycle on and off during typical operation, the efficiency varies as a function of the percentage of on and off time. A unit that operates only a small fraction of the time will have a lower efficiency (in some instances significantly lower) than a unit that operates a larger percentage of the time. The maximum efficiency of these products occurs at full on conditions. An example may be helpful to illustrate this point. A furnace tested in a furnace test laboratory under current industry standards will have a typical efficiency of about 75 to 80 percent. But under actual operating conditions in a house, cycling on and off, this same furnace may only be 50 to 60 percent efficient. Designing test procedures to adequately measure these part load effects is only part of the problem, because on the other side of the coin, DOE is required to design test procedures which are not unduly burdensome to industry. This balance has not been easy to achieve.

As of today, test procedures for all 13 product types have been proposed, and final test procedures have been promulgated for 10 of the products: room air-conditioners, dishwashers, refrigerators and refrigerator-freezers, freezers, clothes dryers, water heaters, television sets, clothes washers, central air-conditioners, and humidifiers and dehumidifiers.

Section 325 of EPCA requires the development of energy efficiency improvement targets for each product type listed in the act. NBS is again responsible for determining the targets and recommending them to DOE. These targets are to be the maximum that are both technologically and economically feasible. The aggregate energy efficiency improvement for products 1 through 10 manufactured in 1980 must exceed the efficiency level of like products manufactured in 1972 by not less than 20 percent.

But only the aggregate improvement of all 10 product types must exceed the 20 percent requirement. For example, the target for home heating equipment is 9 percent, whereas the target for television sets is a 79-percent efficiency improvement. Individual product targets are an average improvement. Room air-conditioners, for example, has a proposed efficiency improvement target of 30 percent. This means that the room air-conditioner industry as a whole must improve efficiency levels by an average of 30 percent. Some products may only improve 20 percent and others may improve by 40 percent. The target is an industry-wide average goal.

These targets are considered voluntary in that there are no requirements for an individual manufacturer to achieve the target. If, however, during the course of product improvement it is determined that the industry is not likely to meet the voluntary average targets, proceedings would commence to establish minimum efficiency standards. These standards are already around the corner and will be discussed later on in the discussion on the pending National Energy Act legislation.

To date, proposed efficiency improvement targets for all 13 product types have been published and public hearings completed. DOE is currently reviewing and analyzing comments, however, final targets

will not be promulgated if the NEA is enacted prior to the Christmas recess as anticipated.

The Federal Trade Commission has the responsibility for administering the labeling portion of the program under section 324 of EPCA. The FTC is responsible for publishing labeling rules and designing and issuing the labels which manufacturers will affix to the products. The label will be designed so that the information displayed will be easily understood by the consumer. The basic information to be provided on the label will be typical annual operating cost during a representative average use cycle. A range of operating costs of other brands of similar sized products will also be provided so that a consumer can judge if he or she is purchasing a product that is near the minimum operating cost (high efficiency model) or the maximum operating cost (a low efficiency model). Other useful information that may also be provided on the label are: efficiency ratings, costs by geographic region for air-conditioning and heating products, and variable costs resulting from energy price variations and certain usage patterns. The FTC contracted with several independent research firms to perform human factors studies to determine what information is most useful to the consumer and what level of understanding the average consumer can be expected to reach in interpreting a label. The preliminary results of these studies have led to the sample labels which have recently completed field testing. It should be pointed out that these are preliminary and do not necessarily reflect what the final labels will look like.

The FTC's current schedule is to publish a proposed rule sometime in the latter part of December. FTC anticipates the publication of a final labeling rule in the spring of 1978 with labels following in the marketplace in mid-1978.

The fourth major element of the program, and possibly the most important, is the consumer education portion of the program. Section 337 of EPCA requires that DOE develop a consumer education program to operate in conjunction with the other key elements of the Consumer Product Efficiency and Labeling Program. DOE is currently developing a consumer education program which will address the significance of annual operating costs and their relationship with life cycle costs and the first cost of the product. The consumer education program will also address the way in which a consumer can most effectively comparison shop with the help of energy labels to obtain the best buy for his needs.

DOE is currently working with numerous groups: Manufacturers, distributors, retailers, consumers, plus State, local and other Federal Government agencies. An important group that will receive considerable attention is the Nation's homebuilders. For several of the product types, namely, furnaces, air-conditioners and water heaters, the principal purchasing agent is most often the builder. The consumer, in general, does not have much to say (or in the past shown much interest) as to what type of furnace, water heater or air-conditioner is installed in a new home. Builders have typically installed low efficiency appliances commonly referred to as "the builders special." I believe that with a concentrated education effort in this area, not only will the builder have more and better information at his disposal, but the consumer

will also be more educated in what to look for and ask for in new house construction.

DOE is also developing television and radio public service announcements to inform the public how to operate existing consumer products in a more energy conserving and cost saving manner. Some of these announcements will be aired over the coming weeks and months.

NATIONAL ENERGY ACT

I would now like to briefly talk about the pending legislation resulting from the President's National Energy Plan. One portion of the National Energy Act deals specifically with the efficiency of household consumer products. This provision in the act deletes authority for the target program and requires the establishment of minimum efficiency standards. Under the minimum efficiency standard program, every product manufactured will have to meet or exceed a minimum efficiency standard. This type of efficiency program will require extensive analysis in order to set meaningful standards that will achieve energy conservation and still allow industry to manufacture without major disruptions. The staff must study the engineering technologies available to produce more efficient products and the economic impact of the standards. These analyses must include: (1) the projected energy savings to result from each standard, (2) the savings in operating costs over the life of the product compared to any increases in initial cost or maintenance costs which are likely to result from imposition of the standards, (3) any lessening in the utility or performance of the product, (4) any negative effects on competition likely to result from the imposition of standards, and (5) other relevant factors.

Other elements of the legislation provide that standards for 9 products be finalized by 1980 and that the remaining 4 product standards be issued by 1981, allow standards to be set by fuel type and by classes within a product type, provide exemption for small manufacturers for 2 years, and allow for standards to be set on products in addition to the 13 listed under certain conditions. Given all of the requirements the number of standards issued could be as high as 70 to 100.

The difference in the potential energy savings between the 1985 and 1995 figures stem from the fact that by 1985 only a small number of existing home appliances will be replaced by the more efficient products. On the other hand, by 1995, it is assumed that the majority of existing home appliances will be replaced by the more efficient products, since the maximum average life of most appliances is about 15 years. The number of barrels of oil equivalent savings will progressively increase, year by year between 1985 and 1995, as the more efficient products are added to the appliance population.

The last program I would like to mention is the Appliance Retrofit Program. This program primarily concentrates on devices that can be installed on existing residential furnaces and water heaters.

Our major effort to date has been in the area of automatic flue or vent gas dampers. DOE is working with the ANSI Z21 committee, and other organizations in the development of a standard for the electrical type dampers. This standard should be published in the very near future.

In closing, we believe that the Appliance Efficiency and Labeling Program is important and will make a major contribution to the Nation's conservation effort. We are also keenly aware that the key to public acceptance and support of the program is a good, sound consumer education program which reaches every segment of society. To this end, we at DOE solicit your support in helping to disseminate this important energy conservation message to the public.



